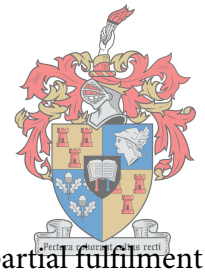
Criss-cross

on weaving as a time-based process

by
Marguerite Roux



Thesis presented in partial fulfilment of the requirements for the degree Master of Visual Arts in the Faculty of Arts and Social Sciences at the Stellenboch University

Supervisor: Professor Vulindlela Nyoni

March 2018

Important Information

Time

According to the Gregorian Calendar a year has twelve months
and a month has either thirty or thirty-one days
except for the second month that has twenty-eight days
unless it's a leap year which is every fourth year
when the second month has twenty-nine days,
a leap year has three hundred and sixty-six days
instead of three hundred and sixty-five.
There are fifty-two weeks in a year.
One week has seven days and one day is twenty-four hours
with sixty minutes per hour, sixty seconds per minute
and increments of a second to measure anything smaller.
According to the International System of Units,
the second is the base unit for measuring time.
The second can be used with metric prefixes to refer to
multiple and submultiples of the second.
The second is not used to refer to a time of day,
instead telling time is the task of time scales like the clock.
Units of time like the minute, hour, day or month
are not part of the International System of Units
but can be used with it.
All these units can measure duration.

Instruments and Terminology

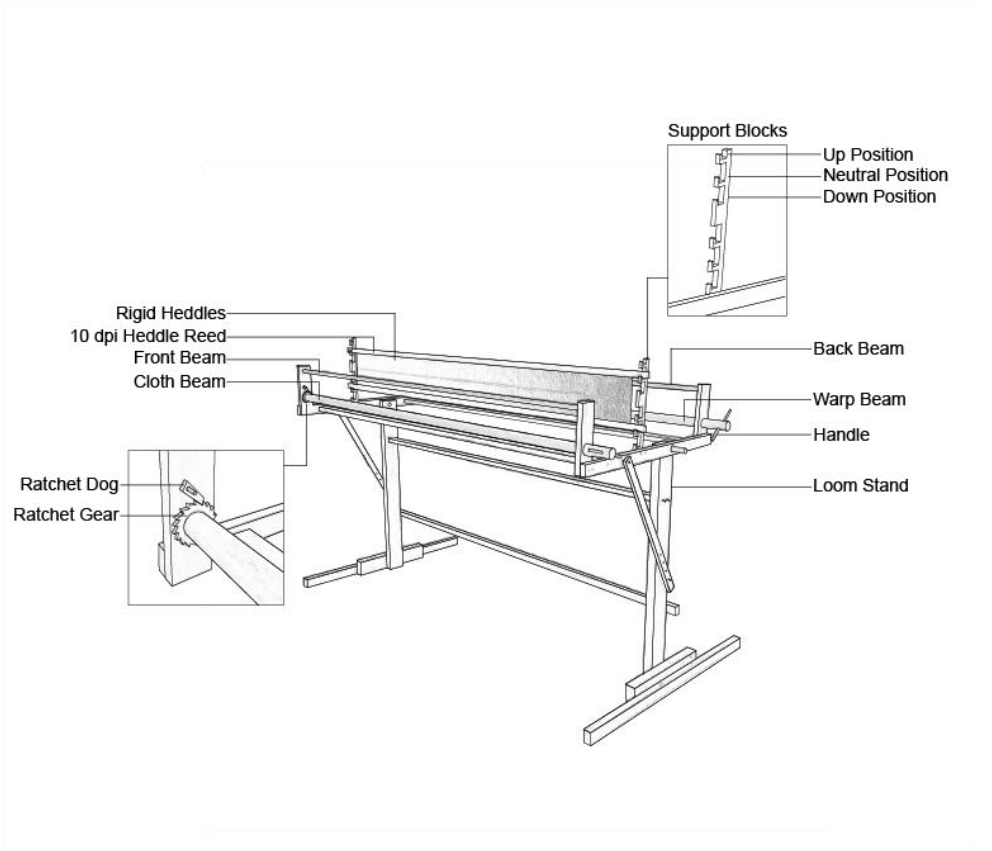


Fig. 1. Diagram of the weaving loom I built for the performance *In Time.* 2017

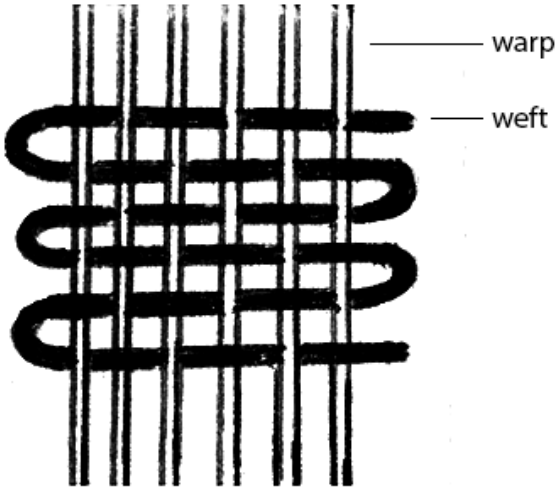


Fig. 2. Diagram showing plain weave structure with warp and weft. 2017.

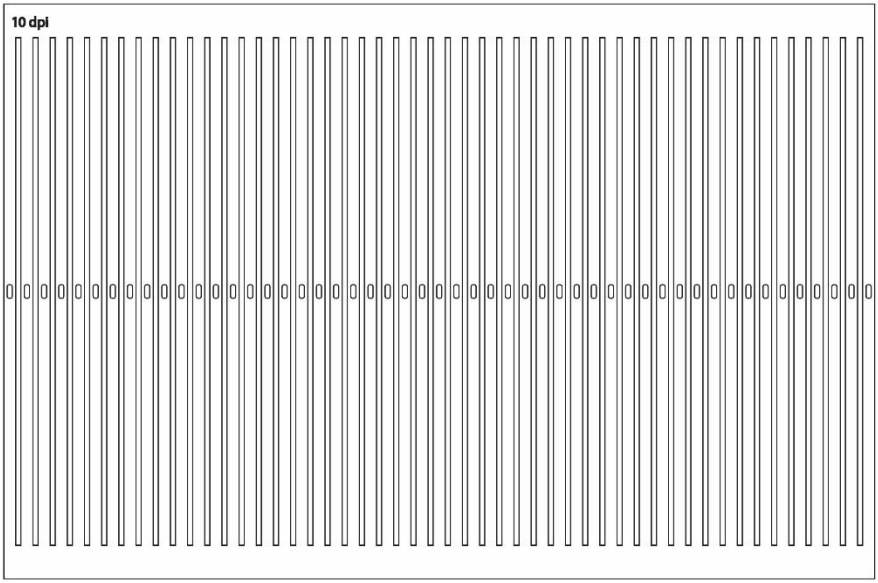


Fig. 3. Rigid heddle reed design for laser cutting. 2017.

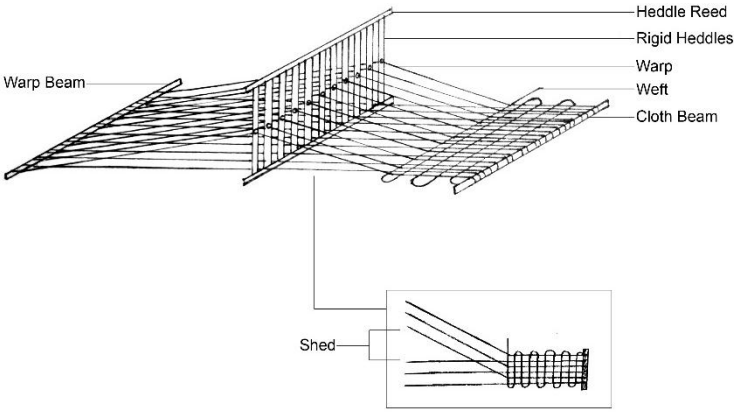


Fig. 4. Diagram of a warped loom showing the shed that forms as a result of moving the heddle reed up or down. 2017.

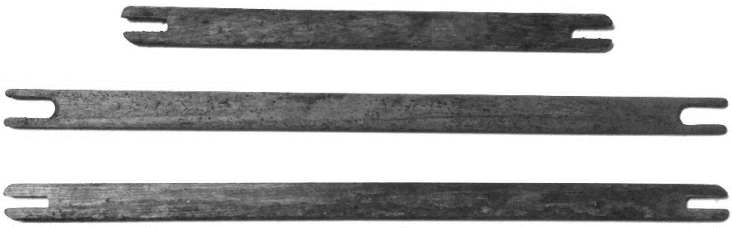


Fig. 5. Photograph of stick shuttles. These were thrown out along with a weaving loom and I happened to see the advertisement online. I collected it lying in the rain and dirt outside the previous owner's house. 2017

Fig. 6. Photograph of a shuttle with fax paper yarn. 2017.

Declaration

By submitting this dissertation electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

SIGNED:

…… ……

Marguerite Roux Date

Acknowledgements

I am truly thankful for all the support I have been given during my studies. I would first like to thank my supervisor Vulindlela Nyoni for his guidance, time and dedication.

My sincere thanks to Joani Groenewald, Edwin Hees and Michaela Howse for their extremely valuable input.

To my friends (local and abroad) whose interest and support have been of great worth throughout this process.

I must express my profound gratitude to my family for the motivation, reassurance and willingness to help, and to my boyfriend for his unfailing encouragement, support and cups of tea. This accomplishment would not have been possible without them. Thank you.

Abstract

This thesis investigates weaving as a method concerned with the process of making rather than a process centred around the outcome (as is customary). My work is situated in a fast-paced and technologically-driven culture and I position the process of weaving as a political act of *taking time*. This act may subvert unrealistic industrial ideals of production and comment on traditional notions of weaving as women's work Furthermore, I deliberate on the role of the weaving loom as a possible extension of the weaver's body and critically establish my own body as a machine-body.

Opsomming

In hierdie tesis ondersoek ek weefwerk as 'n taak wat gefokus is op die maak-proses eerder as 'n proses wat draai om die uitkomste (soos in die algemene gebruik). In konteks van die gejaagde tegnologies-gedrewe bestaan van ons kultuur identifiseer ek my weefwerk as 'n politiese daad wat daarop fokus om *tyd te vat.* Hierdie daad kan moontlik onrealistiese industriële produksie ideale ondermyn en kommentaar lewer oor die tradisionele idee van weefwerk as 'n vrou se werk. Ek skryf oor die rol van die weefraam en sien dit as 'n moontlike deel van die wewer se liggaam. Verder peins ek oor my eie liggaam as a masjien-liggaam.

CONTENTS

CHAPTER ONE: INTRODUCTION

> "Modern, Western man [sic] […] lives in a world that runs according to the mechanical and mathematical symbols of clock time. The clock dictates his movement and inhibits his actions. The clock turns time from a process of nature into a commodity that can be measured and bought and sold like soap or sultanas. And because, without some means of exact time keeping, industrial capitalism could never have developed and could not continue to exploit the workers, the clock represents an element of mechanical tyranny in the lives of modern men more potent than any individual exploiter or than any other machine" (Woodcock, 1944:65).

George Woodcock writes that the clock has had a more radical influence on Western society than any other machine. It has enabled people to measure time in a more concrete way than any candle, lamp or sundial has ever been able to do, and it has provided the means for the establishment of an exploitative industrial system (1944:65). The clock has furthermore become more than a means to measure time. Today it is also a driving force or catalyst for action.

Regarding the accelerated tempo of life during and after industrialisation, Woodcock explains that "time as duration has become disregarded, and men began to talk and think always in 'lengths' of time" (1944:66). Furthermore, the more that could be done in one length of time (be it a second, a minute, an hour or a day) the better, because time is considered to be money[1] (Woodcock, 1944:66).

---

[1] The phrase "time is money" is commonly accredited to Benjamin Franklin as he used it in 1748 in his essay titled "Advice to a Young Tradesmen" (1). This exact phrase was also used on a few occasions in *The Free Thinker* periodical as early as 1719 (1923: 128).

Today Western culture is arguably characterised by a feeling of having everything immediately available, 'at our fingertips' so to speak. 'Quick-fix', 'on-the-go' and 'impatient' are the pace-setting buzz words that describe contemporary Western culture. These words refer to something not so different from that which Woodcock described, when he said:

> "Now the movement of the clock sets the tempo of men's lives – they become the servant of the concept of time which they themselves have made, and are held in fear, like Frankenstein by his own monster. In a sane and free society such an arbitrary domination of man by man-made [sic] machines is even more ridiculous than the domination of man by man" (1944:66).

For Woodcock, time should not necessarily become the dictator of our actions. But, we choose to worship the clock and hand over control to it in exchange for its (oppressive) rule. Woodcock is hopeful that we will not always live in subordination to the clock, but that instead, the clock would be allowed to take on the function it was intended for:

> "Mechanical time would be relegated to its true function of a means of *reference and coordination*, and men would return again to a balanced view of life no longer dominated by time-regulation and the worship of the clock. Complete liberty implies freedom from the tyranny of abstractions as well as from the rule of men" (*own emphasis*, Woodcock, 1944:66).

1.1 Background to Practice

In my art practice I aim to investigate the notion of 'clock time' as a means of "reference and coordination" (Woodcock, 1944:66). I do not argue for or against the clock, but rather deliberate on the perception and experience of clock time.

My art practice consists largely of weaving [refer to Fig, 1-6 for tools and terminology] thinly cut paper strips on handcrafted weaving looms in an attempt *to take* (my) time and to measure time. I weave with paper because of its fragility and ephemerality. It will become clear later in this document that my focus is on the process of weaving rather than the end product. It is, therefore, important to me to select a material that allows me to become absorbed in the process. The thin paper strips can break easily and therefore the weaving process requires meticulously careful attention and a high level of concentration. The inelastic nature of paper makes it fragile and more difficult to weave with than thread, resulting in more time spent than if I were weaving with thread. There is very little room for error. Yet, mistakes are part of the process and if these mistakes are made, or if something breaks or goes wrong, I can only try to fix what has been broken and continue with the process.

Personally, I do not have an aversion to mistakes as they are evidence of and serve to signify work done by hand. Machines also make mistakes, but usually not of their own accord; machines are made by people and people make mistakes (Cascone, 2000:13). I believe imperfection is integral to handiwork and in turn to progression, as the glitch is what prompts us to improve our systems and our machines. I do not aim to develop my tools to hide my mistakes; instead I embrace the mistakes as small moments imbued with potential.

My intention is not to create a durable product, because my focus is not on the product, but on the process. Therefore, the act of weaving becomes the artwork and the object produced is simply a by-product of this action. As such, it is not of cardinal importance that the material I am using should be aesthetically pleasing or necessarily durable. The material is

deliberately not of a high quality – I often use fax paper or paper from the telephone directory [Fig. 6, 7, 8, 22-24].

My choice of material is significant in terms of the throw-away culture it references. The term 'throw-away culture' refers to a mass consumer culture and to the excessive production of disposable and short-lived products. Phonebooks, tills slips, marketing flyers and fax paper are similarly temporal and easily replaceable items produced in a consumer culture. These paper documents are fragile and easily classified as redundant. However, the information contained in these documents is usually valuable – even if the value itself is also short-lived in the light of newer information sharing apparatuses that replace the function of the paper.

Fig. 7. Marguerite Roux. 2014. *Configuration Zero*. Woven Phonebook Paper. 29 x 29 cm.

I am attracted to the aesthetics of these documents in the sense that the text, data and symbols printed on these documents could be symbolic of the ever-changing relationship between humans and technology. Machines print text and symbols, yet humans program the machines; there is a reciprocal relationship between humans and machines. Hand craft is present behind (for example) the machine construction, printing process and typesetting of the telephone directory. In using paper and by weaving with paper in a machine-like fashion, I aim to celebrate the role of the hand alongside that of the machine. Artist, Syniva Whitney writes about "the hand and the digital in contemporary art and the possibility of moving beyond this modernist division […]" when she affirms that "[t]he connection between body and mind, form and function, the sacred and the secular is very apparent in the art of weaving" (2010:6).

My research consists of both a practical as well as a theoretical component, which will mutually inform one another. The practical component revolves around the performance *In Time*[2] to be presented as part of my final exhibition. Throughout this document I refer to *In Time* in an attempt to provide insight into my practice. The performance involves myself weaving on a hand-crafted loom in a public gallery space.

In my art practice I employ a method of 'measuring' time. Measuring includes the operation of assessing the degree, value, size or amount of something. I mark the start of a work session by taking note of the time and again jot down the time I stop. I also count the number of weft strands I weave, perhaps as a metaphor for counting time, but not a time that is in synchronisation with clock time – rather another more subjective

[2] The performance *In Time* was first presented in August 2017 at GUS (Gallery University Stellenbosch) as part of the MA (Visual Arts) review exhibition, *Threshold.*

experience of time. The clock, the loom, my body and my experience are the instruments that help me assess, ascertain or count the duration of time spent (not necessarily and not always according to standard units of time).

One could argue that my research is subject to the tyranny of the ticking clock, the mechanical dictator. Yet, I prefer to think of the ticking clock as a means of "reference and coordination" (Woodcock, 1944:66). My work is recorded as lengths of time, but not lengths of time in service of the clock. Rather, these are lengths of time *taken,* in service of my hand driven practice, against the backdrop of a fast-paced digital age where time seems to be a scarce commodity. Within my lengths of time I experience time in a visceral, sensory way, as a process of natural change happening in my body, and in relation to my weaving loom and my environment. It is significant that I engage with an arguably traditional or ancient and largely mechanical act of making in a predominantly digitised contemporary landscape.[3]

Lutz Koepnick references philosopher and cultural critic Walter Benjamin's (1892 – 1940) description of slowing down by walking turtles on a leash. Koepnick explains the idea when he says that,

> "[t]o stroll with a turtle around 1850 was to counteract the force of industrial speed and traffic; it was to traverse and map the modern city, not according to the abstract and accelerated tempos of urban transportation systems, but the sluggish rhythms of the human body. Turtles reminded urban subjects to use their bodies

[3] The digitised landscape does not refer to a landscape that I have created myself. Instead I experience this landscape as a 'given' context in which I am working.

and senses as the principle measure of things" (2014:217).

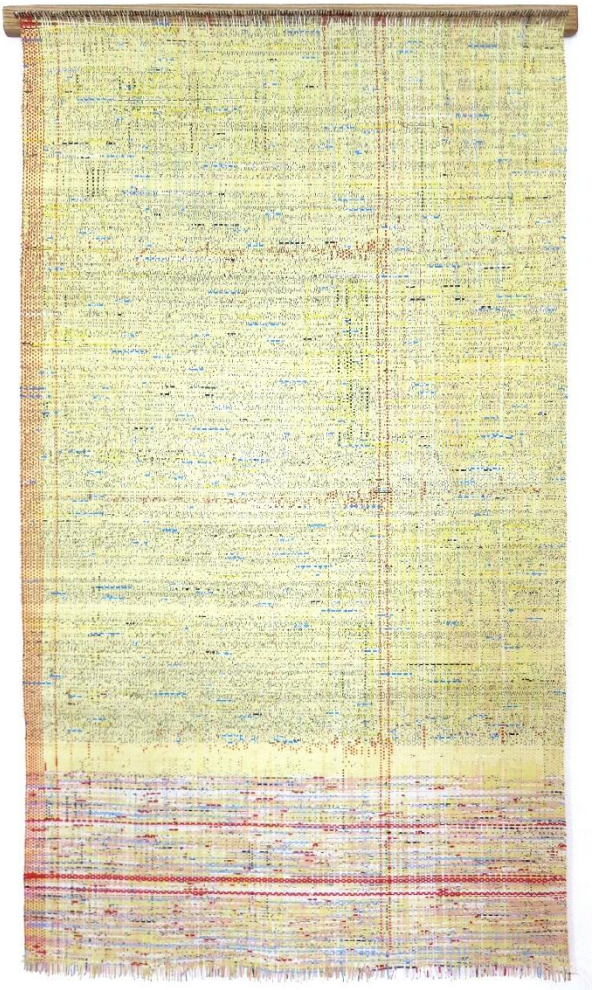


Fig. 8. Marguerite Roux. 2016. *Index I*. Woven Phonebook Paper and Wood. 108 x 63 x 3 cm.

By purposefully *taking* time and tracking time, I simulate the experience of taking a turtle for a stroll. Although clock-time is a driving force behind my research – a catalyst that drives me to action; I prefer to think of my process as one that briefly takes note of, but then "suspend[s] an awareness of time's forward flow" (Carrico, 2008:1) even if it is only momentarily/within the lengths of time taken.

1.2 Aims and Motivation

My interest in weaving as a time-based process was sparked through an observation of the protracted procedure of weaving itself. Weaving is often considered a results-based process in which hard labour is performed to achieve a desired outcome. The process itself is attractive for me because it allows me to question, but also to engage in, the luxury of taking time simply for the sake of taking time. For me, the value of weaving lies in the act of taking time, particularly as a form of silent protest against our fast-paced culture. I am motivated by the option of stepping away from a 'quick-fix' mindset in order to find a method of working that is not fast-paced and outcome driven. In order to do so, I specifically investigate the conjunction of the notions of time, technology and weaving.

This topic emerges in a synchronous way with the development of the global Slow Movement[4] (Honoré, 2004:12). The philosophy of Slow does not prescribe that everything should be done "at a snail's pace," instead it could yield results faster (Honoré, 2004:13). Rather than being an indication of speed/pace, Slow refers to an attitude of "calm, careful, receptive, still, intuitive, unhurried, patient, reflective [and] quality-over-quanitity" to counteract the "busy, controlling, aggressive, hurried,

[4] Chapter Two presents more information on the need to slow down, which is part of the philosophy of the Slow Movement.

analytical, stressed, superficial" (and the list goes on) nature of modern culture (Honoré, 2004:13). This movement is about "making real and meaningful connections" with ourselves, the people around us and the things and places we interact with or experience (Honoré, 2004:13). Through my research I aim to surrender myself to work with the flow of time in a connected and conscious way rather than being driven by impatience and fighting against time.

In this investigation I will look at the development of clock time and other notions of time. The arguable need for slowing down in an increasingly digital age is explored and I take note of the possibility of a new conception of time that would perhaps fit our era more accurately. My focus is on time and the means by which it can be measured. I will discuss the notion of time in order to gain clarity on how we experience time (as slow or fast) from a philosophical more than a scientific perspective.

This thesis will further investigate the time spent on the activity of weaving as either work or labour[5]. Time-based processes will be discussed as well as the result or by-product of an activity that prioritises process over product. My paper is not intended to be in resistance or opposition to the machine or clock time. I do not wish to present this thesis as a nostalgic yearning back to a more romantically conceived of earlier time or era. Instead, in positioning this research within the framework of a Slow culture, I hope to comment on 'fast-paced living' as a consequence of industrialisation, but also that it presents us with a choice about how we want to be or live. I have wanted to investigate my own position within a 'quick-fix' and 'on-the-go' environment.

[5] The distinction between work and labour is explained in Chapter Four of this thesis, through the ideas presented in Neil Maycroft's paper "Labour, Work and Play: Action In Fine Art Practice" (2005).

On the subject of technology, this research project particularly explores what can be termed the 'techno-human condition'; the ability of technology to provide extensions of the human body that expand the body's natural capabilities. This bodily extension of merging with technologies or machine is presented in the form of the machine-body. I use the weaving loom as a possible extension of my own body as an example.

My aim is to investigate whether weaving can be used as a means of documenting time (in an attempt to 'take time'[6]) rather than as a method of making with an end goal in mind. My investigation takes place by means of a machine-body. Through this undertaking, I hope also to subvert the traditional assumptions/meanings ascribed to clock time and traditional weaving processes. In the exploration of my research aim I ask,
"what is weaving?"
"what is time?"
"what is the machine-body?"
"how can my body be seen as a machine-body?"
"can weaving be a suitable means for documenting time?".

1.3 Scope and Limitations

Time is an elusive concept. Even the world's greatest philosophers have not been able to settle on its definition. The focus on time in this paper is not an attempt to provide any ground-breaking explanation of time and this project will certainly not provide an ontological study of time. My thesis will also not offer a historical account of weaving or of technology. Instead I emphasise the open-endedness of time and explore weaving and technology by briefly mentioning historical points that struck me as

[6] To take one's time usually refers to the option of spending as much time as is desired. By taking time, I mean to claim time, to use the option of spending time.

relevant and important in my endeavour of developing a machine-body through the act of weaving.

I do not write from an overtly politicised South African position, but I believe that if I wish to write in my own words, I must acknowledge my position; that I am South African and that this forms my socio-cultural framework.

I investigate weaving as a process of documenting and taking time, where the woven object becomes a tapestry of lengths of time, measured time. I regard weaving as a time-based rather than results-based process.

This process of making is constrained to the use of a weaving machine, a handcrafted loom, which serves perhaps as an extension of my body. As such, I will specifically reflect on the machine-body and characteristics of technology that influence our perception of time.

My intention is further not to furnish the reader with an in-depth analysis of my artworks, but rather to provide a platform for the reader to engage with my work. I refer to artists, artworks and theories that provide a foundation upon which my own body of work can be received and experienced.

1.4 Framework

My research is not overtly framed by an anti-capitalist perspective, yet I am sensitive to some of the consequences of capitalism. I am aware that the notions endorsed in this thesis do comply with anti-capitalist ideologies that are, for example, against exploitative means of production. Perhaps my work also sits in a framework of anti-consumerism where durability of products and the quality of manufacturing processes and production experience is emphasised. I prefer not to position this research *against* ideology, but rather to position it critically in relation to these ideologies. With this in mind, the ideologies behind the Slow Movement perhaps

inform my framework most closely, influencing my perspectives on weaving, technology, time and art practice.

In terms of my discussion on the technological or machine and human interface, my research is informed by complexity thinking as it relates to aspects of posthumanism. The term 'posthuman' has been used since the late 1970's, for example, in Ihab Hassan's essay "Prometheus as Performer: Toward a Posthuman Culture?" (1977) in which he writes about the increasing presence of science in everyday life. Posthumanism questions the definition of 'humanness' and what it entails to be human (Ploeger, 2010:9). Transhumanism looks more specifically at the ways in which humans use technology to enhance our selves, for example, through hip replacements or medication that improves concentration (Allenby & Sarewitz, 2011:6). These enhancements have been in use in different types of ways for many years, and it has been argued that people and their technologies and tools have co-developed since the "pre-dawn of civilization" (Allenby & Sarewitz, 2011:2). Like posthumanism, transhumanism also calls into question what it means to be human, because of its focus on a new type of 'humanness' that takes into consideration technological development and the existence of a technological-human or techno-human (Allenby & Sarewitz, 2011:5).[7]

I understand anti-capitalist, anti-consumerist 'Slow' thinking, notions around femininity and being a female artist who weaves, as well as

[7] My framework and ways of thinking are hence affected by debates around the influence of technology on the human condition and what it means to be human. What it means to be techno-human or what the techno-human condition entails influences my theoretical and practical concerns. I work in an environment, furthermore, that can arguably be framed by cybernetic feminism that according to Sadie Plant "does not […] seek out for woman a subjectivity, an identity or even a sexuality of her own", because, she says: "there is no subject position and no identity on the other side of the screens" (1995:63). Plant responds to Luce Irigaray's idea of the feminine as well as the work of Gilles Deleuze, Felix Guattari and cyberpunk authors. Art practices like that of the *VNS Matrix* who wrote a cyberfeminist manifesto, play a major role in the discourse around cyberfeminism.

technological change and the changing condition of 'humanness' to altogether influence my perspective of my self and my identity. The discourses around femininity, technology and humanness collectively and complexly describe and make up the compound self; perhaps the compound techno-human-self as well as the multifarious body or multifaceted machine-body.

1.5 Breakdown of Chapters and Literature Review

With this framework in mind I embark on my investigation and present herewith a breakdown of my chapters.

Chapter Two will set out to provide a very brief introduction to the art of weaving and explain some of its uses both locally and internationally. This chapter will attempt to establish weaving as a practice in both craft and visual art environments. In presenting a brief history of weaving, I will mainly reference *The Book of Looms* (1997) by Eric Broudy and *On Weaving* (1965) by master weaver Anni Albers. Another insightful text on the history of weaving is the book *The Art of the Loom*, written by weaving, spinning and dyeing expert Ann Hecht[8] in 1989.

In Chapter Three I will introduce time as an elusive concept, but continue to explain theories of time, emphasising the split between 'natural' time and clock time, as well as the perception of time as subjective or objective.

[8] Hecht deliberates on weaving looms from various parts of the world and points out that some are more complex in their design that others (1989:9). She emphasises the likeness of different weaving looms; a complex loom is not superior to a simpler loom, as a complex loom does not necessarily produce a more intricate weave (Hecht, 1989:9). In fact, the simpler the loom, the easier it is to create a complicated design in the weave. What is significant here is that more complicated looms were actually developed to make the task of weaving easier and to enable quicker results. This development can be seen as a step towards creating electronic weaving machinery and moving away from hand weaving – a process of speeding up production and not a process of improving aesthetic quality.

I will show that the construction of time as a product of modern systems and human desires was firmly established with the implementation of the notion of Standard Time. Furthermore, I will demonstrate that time can be a source of reference and coordination in a comforting way, rather than be experienced as a commanding force that dictates, and never comes to rest.

I will rely on Henri Bergson's and Edmund Husserl's theories on the domains of time (broadly distinguished as objective and subjective) which they discuss in their writings on the phenomenology of time. Time theorist Melanie Swan reveals a 'missing middle' between these two domains and suggests that there should be another domain allowing for the option of experiencing a multiplicity of times simultaneously. This notion will lead to a brief discussion of time as posthuman as suggested by artist and theorist, Nicholas Sagan. I will explain that our experience of time is largely based on our sense of time perception, whether this is in line with clock time or in resistance to it. Maurice Merleau-Ponty's phenomenology of perception will be mentioned, specifically referring to the role of the body in our perception of phenomena, as well as Albert Einstein's theory of the relativity.

Finally, in this chapter I will refer to the visual arts and the impact that the perception of time could have on the production and reception of creative work within this field. I introduce time as a creative component in our current day and age, and as an important contributor to aesthetic outcomes. In this section I hope to shed light on my own art practice and the contradictions I grapple with regarding permanence and more fleeting moments in the process of art making.

Chapter Four will focus on the machine as a key component in my research and attempt to provide some insight into the human relationship

with the machine as something progressive, but also fear-inspiring. Through a consideration of the writings of Ernest Becker and Marshall McLuhan, I will discuss how the machine can be seen as an aspect of our 'selves' as well as an extension of our bodies, by specifically referring to the weaving loom. My discussion of the weaving loom will be based on a short overview of the development of automated looms in comparison to hand looms. I will consider the role of the human subject in the process of hand loom weaving, rather than weaving with a mechanised loom and attempt to establish the body as an important tool in hand weaving. My aim is to illustrate that body and loom function together, as extensions of each other in the act of weaving.

In Chapter Five I will explore the intrinsic link the loom has to my own practice of weaving and I will frame the weaving loom as an extension of my own body. I will contextualise my body as female, middle-class, white, Afrikaans-speaking and South African, because these aspects of my identifiable self inform the different types of weaving I have largely been exposed to and therefore also my traditional and historical relation to the craft. I will then continue to discuss my weaving practice as a time-based process. This chapter will consider process-based work, investigating the importance of the time spent on completing an artwork. I will deliberate on the made object in a practice set-up where the process is as much part of the artwork as the art object itself, or where the process even becomes the artwork and the created object is only a by-product of the process. This leads me to consider the life of the object after its production, specifically in relation to my choice to prioritise and give primary importance to the process itself. In my own work, the by-product of my process, i.e. the 'tapestry', becomes an object that evidences time spent. To aid my discussion I refer to the work of Marina Abramović and Christine Cronjé.

1.6 Methodology and Strategy

In order to undertake the research described above, I realise that my methodology would need to incorporate certain characteristics, taking into account my focus on process rather than outcome. My theoretical research in the form of this thesis is presented alongside my art practice which takes the form of an exhibition. Together these two components constitute the outcome of my research project. One component cannot stand alone, as the two components have been mutually informative. My methodology could best be understood as practice-based[9] and this section aims to provide an explanation of exactly what this means.

Research is the systematic and rigorous academic pursuit of generating new knowledge that has to be documented and disseminated in appropriate ways (Bowling, 1997:1). Artistic research or 'art practice as research' is a fairly new concept that is gradually gaining acceptance on an international and national level (Combrink & Marley, 2009:179). Although this concept is still developing, Hannula *et al.* write that it can certainly be regarded as a mode of research[10] and a way of collecting and disseminating new knowledge:

> "The accumulation of knowledge in the artistic field is a form of research. Artists carry out research about the reality that surrounds them, about themselves, about their instruments of

[9] The term practice-based research is sometimes used interchangeably with terms like visual arts research (Scrivener, 2002) or arts-based research. In these instances the definitions may differ slightly. For the purpose of this study I delineate what I understand practice-based research to entail, as derived from commonalities between sources that uses the term.

[10] It is interesting to note that debates around art and research have shifted from an "ontological question to a methodological one" (Combrink & Marley, 2009:181); investigating *how* art practice can engage with research rather than *if* it should engage with research (Douglas *et al*., 2000).

> work, and about the complex networks linking these" (Hedberg in Hannula *et al.,* 2005:5).

Henk Borgdorff agrees in saying that artistic research ties together two domains: that of academia and that of art practice (2012:143). In the fusion of art and academia, artistic research can have an impact on both these domains. Borgdorff explains that the link between art and academia is an uneasy one; it is a source of tension because it is based on breaking down boundaries on the sides of both art and academia (2012:143). Borgdorff writes that "these 'border violations' can spark a good deal of tension" as art practice broadens previous boundaries in order to contribute to knowledge not only in a visual and practical way, but in combination with theoretical investigation (2012:143). Academia, on the other hand, is required to overcome its own restrictions in accepting knowledge generated through art practice (Borgdorff, 2012:143).

Throughout my research I have employed a method of shifting between hands-on making and academic reading to accumulate knowledge and develop my argument. Questions and ideas arose through the process of weaving and this encouraged me to step back from the loom for a while and learn about, for example, time. With newly accumulated knowledge I would go back into my studio and consider (for example) time in a new way. My practice would help me think and work through what I had read and in turn spark new ideas on the subject. Again, I would go back to the books to apply what I had learnt through my practice and to further my understanding of the topic. There has been a continuous reciprocal relationship between theory and practice; reading and creating; taking notes and keeping track of ideas.

This type of research does not fit neatly into the traditional qualitative or quantitative[11] categories of research; instead Springgay *et al.* write that this type of research should rather be constitutive of its own paradigm[12] (2005:897). Artistic research should perhaps move away from existing paradigms by means of a prominent shift or rupture where new strategies or methodologies can unfold (Springgay *et al.*, 2005:897). Art practice as research provides the researchers with the opportunity to define their own paradigm for the study. The researcher may draw from both qualitative and quantitative approaches and may invent or use alternative methods. These methods can develop throughout the study and do not have to be predetermined.

---

[11] In *Research at Grass Roots* Fouché and Schurink write that the qualitative researcher does not focus on explanation but on understanding (or *verstehen*) (2011:308). Where quantitative researchers look at scientific fact, qualitative researchers look at interpretation and experience. The means of research for a qualitative researcher is not so much a formula as it is a subjective investigation from a personal perspective. Qualitative research as opposed to quantitative research provides an open paradigm for constructing a research design that often evolves through the duration of the study (Fouché & Schurink, 2011:308). The method of data collection in quantitative research is structured and depends on objective measurements relating to scientific study. Qualitative research is often unstructured or semi-structured and is conducted through interviews, surveys and focus groups, to name a few examples.

[12] In his "A Manifesto for Performative Research" Brad Haseman (2006) proposes an example of a third research paradigm alongside qualitative and quantitative research which he calls performative research. Haseman's new paradigm would have a multi-method approach led by practice and where practice is (a dominant component of) the research outcome (Combrink & Marley, 2009:183). Haseman recognises the need for a textual component in the research outcome in order to adhere to set conventions of academic research, but proposes alternative forms of text than a formal thesis or critical supportive document (Combrink & Marley, 2009:184). Although the issue of what the written component in artistic research should entail has been widely debated, it seems there is an agreement that such a component must accompany the practical outcome of a formal research investigation as it will add "rigour and transferability" to the outcome of the investigation (Combrink & Marley, 2009:184). (For more information on the option of a third paradigm refer to Chapter One of John W. Creswell's book *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (2014).

My process and method have developed as I progressed through my investigation. Data has been collected through theoretical investigations, conversations, through practice and the generation of ideas. My own subjective interpretation of both my practical and theoretical findings influences my methodology. With a mixed method approach my (artistic) research is best described as practice-based[13] rather than qualitative or quantitative research.

Practice-based research can also be described as research *in* practice as opposed to research *through* practice (practice-led research) or research *on* practice (Borgdorff, 2012:24). Research *in* practice means the artist is the researcher and vice versa. The object of the theoretical study is the practical work of the artist, while the artist's studio practice is influenced by findings made through theoretical investigation. Theory and practice co-exist on an equal footing. The acts of invention and interpretation are central to this domain. The research takes place in and parallel to the process of production. In this domain, the outcome has to be both theoretical and practical (Borgdorff, 2012:24). Clearly this type of research resonates with my own methodology.

Research *through* practice, on the other hand, is similar to practice-led research where the nature of the practice is a central focus, but a practical component does not have to be presented alongside the findings of the research (Candy, 2006:1). Knowledge is produced through studying the

[13] Fiona Candlin gives an insightful overview of the development of practice-based research in the visual arts in her article, "Practice-Based Doctorates and Questions of Academic Legitimacy" (2000). She writes that presenting a practical element as part of a PhD was almost unheard of until as recently as the 1990s, let alone conducting a study comprised exclusively of art practice. Although the prescribed ratio between theory and practice for practice-based research varies, there is currently no shortage of universities accepting this type of research as an esteemed and adequate manner of research (Candlin 2000:2).

work of artists. The research leads to new understanding through art practice, but the practical process of the researcher is not a key role-player in the contribution to knowledge and does not have to be presented as part of the outcome (Candy, 2006:3). In my investigation I look at the work of other artists, without presenting their work as outcome of my research. This part of my investigation may be described as practice-led research but in its entirety, this is not the type of research I am doing.

The method further described as research *on* practice does not seem to bridge the gap between theory and practice (Borgdorff, 2012:64) as it is most often a purely theoretical investigation on practice. It is focused on questions like the why, how, what of practice. It may, for example, look at technical or contextual aspects of creating. The researcher is not necessarily an artist or practitioner. This could resonate with my investigation on aspects of weaving or the technicalities of making, yet, again, I only use this type of research as an aspect of my study. My research cannot solely be defined as research *on* practice.

For the sake of clear definition, it is viable to distinguish between these three domains of artistic research (i.e. research *in*, *through* and *on* practice), but in undertaking the actual research it becomes clear that the three fields overlap. Because this thesis is presented in direct relation to, and in support of, a body of artworks that, together, form the result of my research investigation and outcome, my methodology is best situated as practice-based research, even though I investigate *in*, *through* and *on* practice to a degree.

My research strategy is inevitably based on the inchoate nature of artistic research. Employing a method of exploration involving lived experience and subjective analysis, I choose to be proposing questions, rather than providing answers. Through artistic research I use multiple methods of

data collection and “methodologies are invented where no established method exists and this constitutes part of the unfolding of the research” (Combrink & Marley, 2009:185). This strategy is shaped to accommodate the peculiar complex nature of creative projects.

With this in mind, I acknowledge that the research should nevertheless be rigorous and purposeful. Although initial ideas may originate from an intuitive platform, these ideas give guidance to the research process in an attempt to generate original knowledge. In creative disciplines the method of research is often determined by the practice and can therefore be flexible and transformative (Combrink & Marley, 2009:185). My research approach is based on reflecting on my practice through the lenses of theoretical investigation and in turn reflecting on and embodying my theoretical findings in my practice. This strategy relates closely to a qualitative reflexive approach – a method that understands data as resulting from interpretation and furthermore the reflection on such interpretation (and its consequences or outcome). The background of the researcher will have an effect on the investigation (Malterud, 2001:483-484).

A self-reflexive process entails reflection on the research process before, during and after. Combrink and Marley structured their collaborative approach to practice-based research according to three broad steps:

pre-production,[14] production[15] and post-production[16] (2009: 192). In their case, many of the activities that occur under these three steps involve working with the collaborators, which is not required in an individual project like my own, yet in my case these steps can be substituted for studio feedback session with peers or support groups in theoretical research and writing. As such, I found their model useful in structuring my research as a reflexive practice. Reflection takes place throughout the process and I would like to add that it is necessary and useful to set out (on an almost continuous basis) certain milestones upon which to stop and reflect. In my reflection I consider my own practice in dialogue with other forms of practices and I assume a questioning role in considering the context and content of my research as potentially problematic.

Hence, the strategy for my academic research is based on investigating the theoretical work of major authors in the field of weaving, technology, time and art, and also entails discussing the work of artists working in similar media and with similar ideological concepts to my own. My own art practice alongside the examples of other artists enables me to provide a visual balance in relation to my theoretical research. Theory and practice

---

[14] In pre-production the idea of the project is formed and given shape (Combrink & Marley, 2009:192). The researcher sets out a research proposal or any documentation needed for application or funding. Through this process the idea takes shape but remains open ended enough to develop throughout the process. A timeline is drawn up and dates are set out for submission and exhibitions.

[15] During production the theoretical and practical research develops, and is eventually completed (Combrink & Marley, 2009:194-5). Creative production entails developing an idea into an idea-made-visible.

[16] The production step builds up to a final presentation of the research outcome, which may take the form of an exhibition and thesis as in my own research. At this stage, it is important to document the final presentation in order to continue with reflection and/or adjustments in the post-production stage (Combrink & Marley, 2009:195). Reflection and making adjustments are the main actions in the post-production step. An attempt to make sure the research outcome is disseminated and made publicly available for future reference is also of cardinal importance. Feedback and final reflections also take place in this stage of the research.

are intertwined to form a complex web of counter-influences. I use mixed methods in a process of discovery rather than relying on empirical processes and explanations alone.[17] I have set necessary tasks for myself that have aided the progression of my research from something informal and intuitive into something more formal and academic. However, even though I present formal research, my artistic research is still different to any kind of quantitative research. It is certainly closer to qualitative research, but, as explained in this section, artistic research as practice-based research also contributes toward its own unique research paradigm through a mixture of objective and subjective methods and through a fairly open-ended (and open-minded) approach.

[17] In my experience I have found that research in the visual arts often stems from an intuitive kind of hunch or idea and grows progressively to a point where it can be presented as formal academic research.

CHAPTER TWO: WEAVING

weave[1]

/wi:v/

verb

1. form (fabric or a fabric item) by interlacing long threads passing in one direction with others at a right angle to them (Oxford English Dictionary, 2017, s.v. 'weave').

By definition weaving is a method based on the principle of interlacing two thread groups at right angles to each other. The longitudinal (usually fastened) threads are called the 'warp' (or ends), while the term 'weft' (or picks) refers to the moving lateral threads [Fig. 2]. The weft threads are generally fed through the warp threads in an over-under-over-under pattern or plain weave structure (Sondhelm, 2000:62 - 63).

The weaving structure varies depending on the type of weaving done[18]. For example, the weft thread could be fed over two warp threads and then under the next two warp threads continuously. Alongside the type of fibre used, the chosen pattern plays a prominent role in determining the aesthetic or texture of the finished product and ultimately into which category of textile the final product falls. Weaving is commonly used to create different types of textiles or different kinds of products.

Hand weaving is a tactile process that I find attractive in contrast to the digital environment I often find myself in; it is a reminder of the capability

[18] One of many sources that could be consulted for more information on weave structures is the chapter "Technical Fabric Structures – 1. Woven Fabrics" by Walter S. Sondhelm featured in *The Handbook of Technical Textiles* (2000) edited by A. R. Horrocks and S. C. Anand.

of my hands, rather than the abilities of a computerised program. The haptic quality of hand weaving allows the weaver to intimately connect to the material and the process. Weaving has certainly developed into an automated process, but my concern and attraction still lies with hand weaving.

My awareness of weaving could perhaps have its origins in primary school projects of learning to weave with brightly coloured paper, but apart from this, I did not give the craft much thought until my final year as an undergraduate student. I did not grow up in an environment where learning to weave was understood as an essential part of making a living. Elements of weaving have always been present in my life, but they have passed by unnoticed, deemed insignificant. Whether this method of production was present in the doormat or the large pink tapestry on the living room wall (in my childhood home), I neglected to notice it or demonstrate much discernment.

Being in a position to write about my ignorance of how things are made is a symptom of my socio-economic status. In my middle-class Afrikaner[19] culture, growing up in the 1990s and early 2000s, I had no need to learn more about weaving than what was taught in school as a recreational activity, as a technique to use to make pretty cards or cover my books in colourful blocks of woven paper. I did not, for example have to make my own blankets or clothes as a means of survival, and neither did I learn to craft things like baskets; useful for carrying or storing items.

I am intrigued by the realisation that the environment I grew up in and still find myself in is a commodified space, where not only time, but seemingly

[19] The term Afrikaner is used in this thesis to refer to a white, Afrikaans-speaking person.

any item can be classified according to its monetary value. Our exposure to certain methods are determined by our socio-economic situation, which changes the meaning and reception of items, and the reasons for them being made.

This realisation places the contemporary manufacturing of woven cloth in contrast to weaving in its ancient[20] form, which very likely developed out of the necessity to perform a function, rather than as a commodity as it is currently (and perhaps most commonly) known in Western culture. Through my investigation I have developed a critical awareness of the divide between want and need. Now, I cannot help but notice weaving and weaving principles all around me. Apart from engaging with weaving in my practice I also see the principles of weaving in the kitchen towel or bathroom mat, I also see it in nature and in technology; be it the binary logic of digital technology or the metaphoric tapestry of the World Wide Web.

2.1 An Ancient Craft

> "No one knows nor is ever likely to know how weaving began" (Broudy, 1997:9).

Although the origin of weaving is unclear, there are various accounts of where it could have started. In many cultures, tales and legends attribute the invention of weaving to deities or venerated individuals and they place the moment of its invention at the dawn of their culture's own history. In Inca mythology it is believed that Mama Ocllo, the wife of their first sovereign Manco Capac, invented the art of weaving, while in Assyria,

[20] The term ancient refers to all recorded human history from its beginning until the Early Middle Ages (or all human history before the decline of the Western Roman Empire).

Queen Semiramis is honoured as weaver (Broudy, 1997:9). In Egypt the goddess Neith was recognised as the patron of weaving (Gadalla, 2017:275) while it is believed that the goddess Isis[21] invented weaving [Fig. 9] with the help of her sister Nephthys (Kruger, 2001:24).

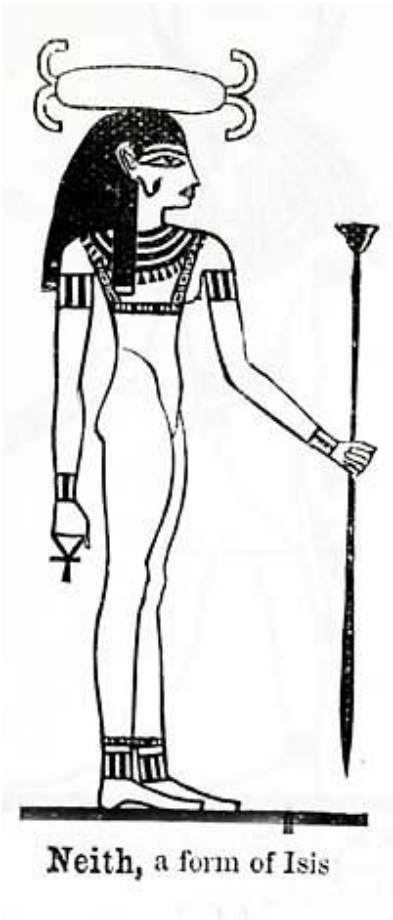


Fig. 9. Neith as Isis with shuttle over her head. (Murdock, n.d.)

[21] Some accounts explain that Neith is actually Isis in another form [Fig. 9] (Gadalla, 2017:275).

The origin of weaving could also be attributed to primitive people who might have been inspired by examples in nature, like birds' nests or interlaced tree vines (Broudy, 1997:9). Even today, if we look at nature, we can see examples of weaving all around us. Broudy refers to an Indian legend that tells of the first girl to weave: she allegedly sat on a river bank and looked at the ripples of the water or lay on her back and looked up at the trees to notice the patterns of woven branches. In this way, she was divinely inspired to create her own designs (1997:10). An African tale tells of a man who, in exchange for offerings and favours, was thought to weave by a spider[22] (Broudy, 1997:10), while the Native American Navajo people were shown the craft by Spider Woman[23] (Kruger, 2001:24). Broudy writes that in China, the invention of weaving was inspired by the silkworm:

> "the prince Hoang-ti wanted his wife, Si-long-chi, to contribute to the happiness of his people. He gave her the responsibility of studying the silkworm to see if there were a way to make the thread usable. She collected some of the silkworms, fed them herself and learned how to raise them. It is said that by accidentally dropping a cocoon into boiling water, she learned the secret of ungluing the filaments from one another. Besides discovering how to reel the silk from the cocoon, she is credited with inventing the loom (c. 2640 B.C.) and has since been deified as the Goddess of Silkworms" (1997:10).

[22] The African tale of a man learning to weave resonates with the Ghanian folktale of two Ashanti brothers who learnt to weave from the spider Anansi. There are various accounts of the story of the spider weaver; one such example being *The Spider Weaver: A Legend of Kente Cloth* by Margeret Musgrove and Julia Cairns (2001).

[23] It is interesting to note that the Spider Woman still plays an important role to the Navajo female community. Within twenty-four hours after a girl-child is born her hand is placed in a spider web as part of a more complex ritual where a medicine man prays to the Spider Women to bless the child as weaver and storyteller (Kruger, 2001:25).

A lot of our present-day knowledge on weaving has developed through generations and generations of transferring the skill from master to apprentice, or parent to child. The tales of the origin of weaving are numerous and it is simply impossible to say with absolute certainly which people first invented the process. Perhaps it would be insightful to look at more concrete examples that tell of the earliest forms of weaving (although this tells us nothing of its origins). Relics that speak of the craft of weaving date back to between twenty-four and twenty-seven thousand years ago (Kruger, 2001:22). These relics, excavated in 1995, consist of pieces of clay impressed with basketry or textile patterns and it is believed that the impressions resulted from woven plant matter (Kruger, 2001:22). Evidence of basket weaving was further discovered in the Guitarrero Cave in Peru dating back to around 8600 – 8800 B.C. (Broudy, 1997:13). Fragments of plain-woven cloth were found and indicated a difference in development between basketry and weaving; examples like a textile fragment from Çatal Hüyük in Anatolia [Fig. 10] date back to about 6000 B.C. (Broudy, 1997:13). With little evidence to go by, it is hard to explain how these pieces of textile were manufactured. It was only later that the first evidence of weaving looms was found,[24] so one can only speculate on the methods used during the first phases of weaving. In making some of my first pieces of woven paper [Fig. 7] I feel a small connection to the uncertainty and excitement that might have been experienced in the discovery of weaving.

As a modern-day weaving apprentice, I learnt (and continue to learn) my skill from YouTube and through trial and error. Through technology, I also have access to the evidence that has been found of the earliest weaving

[24] A possible heading cord on some of the fragments from Çatal Hüyük may suggest the use of a loom (Broudy, 1997:13). The development of the weaving loom is discussed in further depth in Chapter Four of this thesis.

methods in the ancient cultures of Greece, Peru, India, Egypt, China, and the list goes on. In my own practice, through original experience and meditative reflection, I cannot but pay tribute to the ingenious, albeit inexplicable, invention of weaving.

Fig. 10. Carbonised textile fragments from Çatal Hüyük VI, c. 6000 B.C. (Broudy, 1979:13).

2.2 Commodity, Craft, 'Women's Work' and Art

Presumably the needs of the weaving cultures mentioned above were not so different from each other, which would explain the similar development of the craft by people situated at opposite ends of the earth. Of interest in weaving as a global phenomenon spreading over vast cultures, is how weaving has been used very differently from one context to the next. Striking also are the different types of people that execute the task of weaving in different cultures. In some instances a man has been the weaver, while in other cases it has been a child or a woman. Through her investigation on the history of weaving Kathryn Sullivan Kruger found that "in most of ancient cultures textile production was a female activity" (2001:24). If we fast forward to the role players in the development of the automated weaving loom (to be discussed in Chapter Four), we see that all the prominent inventors are male but still the task of weaving is generally assigned to women; it is regarded as a female craft or occupation, associated with the domestic sphere; weaving is said to be "the quintessence of women's work" (Plant, 1995:46)[25]. I recognise weaving as it has been understood as a female craft[26]. However, I also wish to show how weaving has developed as a commodity, craft and form of art beyond the domestic space.

---

[25] The history of craft and feminism is a complex one imbued with tension. The scope of this article does not allow for a discussion of this history but I make mention of the general perceptions on craft, femininity and feminism later in this chapter.

[26] Sigmund Freud stated that "it seems that women have made few contributions to the discoveries and inventions in the history of civilization; there is, however, one technique which they may have invented – that of plaiting and weaving" (in Bell & Offen, 983:338). To me it is not of primary concern whether women or men discovered weaving or what the motivation for this discovery was, yet I do believe that this statement emphasises the notion that weaving has been or is commonly regarded as women's work.

In the ancient world, textiles were made out of a necessity to fulfil particular needs of societies, for example, to be turned into adornments and decorations of the body, the home and other interior spaces (such as tombs). In terms of necessity weaving could still be used for the production of material predominantly for usage as wearable cloths and functional items. Other techniques such as knitting, crocheting, coiling, braiding, twining, looping, knotting and netting could and have been used for the same purposes, but with the mechanisation of the weaving loom, weaving surpassed the other methods in efficiency (Albers, 1965:19) and was therefore also easily commodified.

The innovation and radical development of the weaving loom largely took place in conjunction with, and it was instrumental to, the genesis of Western industrialisation (Jenkins, 2003:717). Industrialisation refers to the age where machines became increasingly automated and factories were established to enable production of consumer items on a massive scale (roughly between 1760 and 1820/1840). The 'spinning jenny', invented in 1764, was a spinning frame with multiple spindles and one of the main inventions in the industrialisation of textiles and weaving (Aspin, 1964:46). One of the consequences of industrialisation was that individuals did not have to be self-reliant. For example, they no longer had to make their own clothes. Instead, they would work in a factory and earn money to buy the commodities they needed[27].

Weaving sometimes entails expert craftsmanship, which can be seen in the tapestries of the ancient world and more recent creations. Weaving as a craft after the period of Western industrialisation usually indicated a connection with the Arts and Crafts Movement (c. 1880 – 1920 in Britain

[27] Although weaving was developed on a massive scale in factories, to an extent, it also remained a hand craft method outside of the factory.

and North America and later in Japan) that promoted the development of a new phase of production, beyond industrialisation. It was not a “fanatical protest against machinery” but it focussed on improved standards and quality of decorative and fine arts that had seemingly declined during industrialisation (Triggs, 2014:38). The Arts and Crafts Movement was inspired by the ideas of, amongst others, William Morris (1834 – 1896), an English textile designer and social activist who played an important role in the revival of textiles in arts and crafts (Triggs, 2014:43). The tapestries crafted by members of this movement were different from those made in the factories, as they were encouraged to undertake production for the sake of beauty [Fig.11], rather than for pure practicality (Broudy, 1979:161).

The German art school *Staatliches Bauhaus*, or more commonly known simply as the Bauhaus was established in 1919 and operated until 1933 (Droste & Bauhaus-Archiv, 1990:17). The Bauhaus weaving workshop was predominantly attended by women as there were not much opportunity for them to join the workshops in architecture and even bookbinding and pottery (Droste & Bauhaus-Archiv, 1990:40). Their weaving workshop was one of the most fruitful workshops between the two world wars and presented its students with the opportunity to work on hand and power looms. Students of the weaving workshop were heavily influenced by the likes of Paul Klee, Wassily Kandinsky and Oskar Schlemmer, who were all teachers at the Bauhaus (Droste & Bauhaus-Archiv, 1990:6).

Fig. 11. William Morris' wallflower design pattern. (Triggs, 2014:12).

Drawing inspiration from these formidable artists, the items created at Bauhaus had a strong link with the fine arts, but were mass produced to suit modern interior design needs and tastes. Bauhaus students were encouraged to work in the zone where craft, industry and fine art overlapped (Broudy, 1979:161).

It is a complex debate, but craft has generally traditionally and throughout history been regarded primarily as women's work and not appropriate to be compared with practices in fine art. Jorunn Veiteberg writes that "one of the preconceptions with which craft is encumbered is that it belongs to the domestic rather than the artistic sphere" (in Wood, 2013:38). Women's work fell victim to the visual hierarchy categorising types of artworks based on associations with gender. In 1960s America these hierarchies were challenged by feminist artists with the rise of the feminist art movement (Holt, 2010:1). After the Women's Liberation Movement, feminist artists were motivated to establish crafts as a convincing art form that could be used as an expressive and potentially subversive practice (Holt, 2010:2, 6).

Before the Women's Liberation Movement female artists were afraid to use 'feminine crafts' because their work would likely have been labelled as 'low art' or even 'kitsch' (Skelly, 2017:1-2). During the 1970s women started to use 'feminine techniques' such as weaving, sewing and ceramics not only as products of intense factory labour, but proudly "flaunting it, turning it into art" says Lucy Lippard in her book *From the Center. Feminist Essays on Women's Art* (1976:57). Feminist artists reclaimed an affiliation with what had previously been described as 'feminine craft', often thought of as 'low art' and they unapologetically affirmed their position in the sphere of 'high art' (Lippard, 1976:45).

Weaving's history has charted a complicated and interesting path as a feminist rather than feminine craft from its rehabilitation in the 60s and 70s until today in contemporary art practice. However, I would like to provide insight into another unique role weaving has played (to this day) on a global scale, as a rehabilitating craft, mostly in penitentiaries.

Fig. 12. Weaving factory at the Auburn Prison. (McHugh, 2010:25).

Towards the end of the period of industrialisation weaving was also introduced into prisons [Fig. 12]. The Auburn Prison (now Auburn Correctional Facility), for example, is a state prison in Auburn, New York, where manufacturing processes such as spinning were introduced in 1819 (McHugh, 2010:22). This was only two years after opening its doors to the first 53 inmates, who were also employed in working on the building

(McHugh, 2010:8). In the 1930s a silk factory was in full swing, where silk worms were raised and fabric was woven by inmates (McHugh, 2010:22).

One of the main reasons behind this prison 'factory' was that the inmates could cover the costs of their imprisonment through their own handiwork as penal labour (McHugh, 2010:22). By selling a variety of goods, the prison could make a profit from the inmates as a workforce (McHugh, 2010:8). Various workshops were presented at the prison and, because of the free labour, convicts provided a production line that could produce cheaper than average goods. This labour system was eventually replaced by the state system and as such the goods manufactured in the prison were to be used for state supply only, effectively lowering the state's expenses dramatically (McHugh, 2010:8).

The implementation of factory work in prisons furthermore supported the (more noble) quest of rehabilitating the convicts, keeping them from engaging in negative activities (McHugh, 2010:17), and, ultimately equipping them with a skill that could be used after their release. Some forms of manufacturing and service provision in the Auburn Correctional Facility (and other facilities) continue to this day[28].

In a South African context hand craft was also used as a tool for social reconstruction after the Second South African War (1899 - 1902).[29]

[28] The prison-industrial complex (PIC) refers to the overlap between government and industry interests and includes using inmates to supply services and products as in the Auburn Facility. PIC is a highly controversial issue in the USA. For more information on PIC from a visual arts perspective refer to the book *Challenging the Prison-Industrial Complex: Activism, Arts and Educational Alternatives* (2011) edited by Stephen John Hartnett.

[29] The Second South African War or the Anglo-Boer War was fought between Great Britain and the two Afrikaner (Boer) republics, The Orange Free State and the South African Republic. In spite of Britain's almost 500 000 soldiers over South Africa's 88 000, it was a tight battle. Britain won the war.

Although operating on very different levels and with vastly different approaches,[30] women like Emily Hobhouse (1860 - 1925) and Florence Phillips (1863 - 1940), both saw the potential of hand craft. From a wealthy background, Phillips had the opportunity to provide handiwork for women and the needy (Arnold, 2017:35). She was born in South Africa but married a British man and so travelled to Britain often and even lived there for some years (Arnold, 2017:36). She was influenced by the British Arts and Crafts Movement in its later years and brought some of what she learnt about craft as an occupation for women to Johannesburg, where she settled with her husband (Arnold, 2017:36).

Emily Hobhouse, who was a British citizen, was a regular visitor to concentration camps in South Africa during the war and an advocate for the humane treatment of war prisoners and women and children in the camps. In 1905 she established the Philippolis Weaving School for poor Boer women in the Free State (Balme, 2012:506). From the start, Hobhouse learnt needlework and lacework skills herself in order to teach the Boer girls (Balme, 2012:507). Her ideals were to teach these girls to turn idle time into productive time that could be educational and possibly provide an income (Balme, 2012:501).

The process of weaving has an important role in the abovementioned accounts, yet the focus of the process of weaving generally remains the end product. The act of weaving is performed as a means to an end: to create something useful, decorative, or an artwork that could be critical and subversive. It is not often that the act of weaving is seen in isolation

[30] For more on how Emily Hobhouse and Florence Phillips' approaches to weaving differed refer to the book *Between Union and Liberation: Women Artists in South Africa 1910-1994* (2017) by Marion Arnold.

from what is created. Although I cannot deny the by-product of my own weaving process, I shift my focus to revolve around the process. The process of weaving enables me to engage with concepts such as time and the machine and the machine-body interface. Weaving allows me to reflect critically on the issues that are prominent in my own life and perhaps that of my generation.

Weaving has come a long way to become a recognised medium and method in contemporary art. Having been established by pioneering artists as a 'high-art' practice and not merely a craft, the use of weaving prevails. Weaving is regarded as good a visual art medium as any, possibly depending on the skill level and conceptual (and contextual) framework of the artwork created. As with any medium, a lower standard of art can be created, yet from a post-modern perspective the boundaries between what was previously classified as 'low-art' or 'high-art' are also not as distinct today. The postmodern tradition, like the feminists in the Women's Liberation Movement, challenges hierarchies, blurs boundaries and even argues that "anything goes"[31] (Clicqué, 2005:27).

There is no shortage of contemporary artists who employ the use of traditionally 'feminine craft' skills in their art practices. From South Africa and the diaspora alone, artists as diverse as Igshaan Adams, Siemon Allen, Tamlin Blake, Pierre Fouché, Liza Grobler, Nicholas Hlobo. Athi-Patra Ruga and Fabian Saptouw implement these techniques, specifically weaving and needlework techniques. Artist Hanje Whitehead writes about

[31] The phrase "anything goes" can be described as the slogan of postmodernism that encourages a disregard for rules and a "do as you like" attitude (Clicqué, 2005:29). However, Paul Feyerabend who coined the phrase felt that it came to describe something different from what he initially had in mind, because he "never meant a total lack of any rational criteria of science, but a pointed criticism and warning regarding the tendency to make scientific rationalism absolute" (Clicqué, 2005:29).

feminine craft in her MAVA thesis, and says that “while these skills speak to particular aesthetic interests, they undoubtedly signify more complex concerns such as a critical regard of questions of gender and subjectivity; DIY/anti-industrialisation and a labour that is intense, personal and intimate” (2012:48).

In Liza Grobler’s installations we see her setting up a dialogue between the artwork and its place of installation. She is largely concerned with the connections between people and ‘worlds’, and encourages her viewer to become part of the fictional worlds she creates through her practice. As a mixed media artist, weaving, needlework or any “feminine craft” is only one of the methods she uses to communicate her thoughts, questions and ideals. However, these methods have a history and certainly speak about femininity and perhaps the deconstruction of traditional gender ideologies.

Fig. 13. Liza Grobler. 2016. *No More Worlds to Conquer*. Polypropylene Rope Installation. Dimensions Variable. (Stehr, 2016).

Her artwork *No More Worlds to Conquer* [Fig.13] was presented as part of the *Women's Work* exhibition at the Iziko South African National Gallery in Cape Town in 2016. The entire exhibition was dedicated to celebrating male and female South African artists working with thread and craft. Grobler's artwork consists of yellow polypropylene rope that has been woven, crocheted and plaited and draped all over the museum courtyard.

Not only does this artwork participate in the dialogue around 'female craft', it is also in synch with the artist's intentions behind her various other-worldly installations. She says: "I strive to shift perspectives by creating spaces that might be reminiscent of dreams" and continues to explain that these worlds are

> "[a]mbivalent spaces that should not exist in the 'real world', but do for a short time, and then live on in memory. These spaces are created through repetitive, seemingly insignificant, actions" (Grobler in Stehr, 2016).

I can relate to the artworks' impermanence, as my own weaving performance is temporary and fleeting. Grobler weaves to create a specific (and site-specific) object and as such the work is not focused solely on the process of creation, but perhaps rather on the process in which the viewer can experience and interact with the work. The process and the moment play an important role in Grobler's artworks, including *No More Worlds to Conquer*. The feminine stereotype associated with weaving also adds depth to the experience of the artwork. Similarly, in my own work, the discourse around feminine crafts and women's work, like weaving has added depth to my exploration of time and technology.

In this chapter I hope to have shed some light on the roles weaving has played on a global scale, since ancient times until today. It has been used

to meet human needs such as the necessity for clothes and blankets, as well as for decorative purposes. Weaving is further a tool, like any other in the visual arts, that enables the artist to critically engage with conceptual and technical questions and problems in his/her art practice in spite of (and perhaps with the help of) the traditional consideration of weaving as women's work.

CHAPTER THREE: TIME

"What is time then? If nobody asks me, I know; but if I were desirous to explain it to one that should ask me, plainly I do not know" exclaims St Augustine (in Honoré, 2004:18). Time is an elusive concept. Nevertheless, this chapter is dedicated to exploring theories and notions around time. I attempt to situate my research within an age of acceleration, an age where it is customary to say 'I don't have time', by investigating our collective awareness of, and obsession with speed or the acceleration of time. As a sensitive reaction to fast-paced living, I employ a method of *taking* time in my practice. In this chapter I would further like to introduce time as a component of creativity in our current epoch, and as a contributor to aesthetic outcomes. As such, the material nature of time comes into question, leading me to a discussion of time and the technology of time, specifically clock time. I will further discuss the perception of time, for example, referring to the philosophy of time and the human experience of time. This will introduce and aid in my understanding of time as it relates to the body, creativity and the visual arts.

3.1 A Need for Slow

Canadian journalist Carl Honoré writes about the Slow Movement and the need to decrease the pace of living in his book *In Praise of Slow* (2004). He describes the era we live in as the 'age of rage' and contextualises the Slow Movement as a rebellious act against the world's obsession with increasing speed (Honoré, 2004:12). Honoré emphasises his own fixation with speed by contrasting an experience he had as a teenager (before rushing was at the heart of all activities) to an experience as a grown man (looking for quicker ways to do almost anything). He writes:

> "On a sun-bleached afternoon in the summer of 1985, my teenage tour to Europe grinds to a halt in a square on the outskirts of Rome. The bus back into town is twenty minutes late and shows no sign of appearing. Yet the delay does not bother me. Instead of pacing up and down the sidewalk, or calling the bus company to lodge a complaint, I slip on a Walkman, lie down on a bench and listen to Simon and Garfunkel sing about the joys of slowing down and making the moment last" (Honoré, 2004:1).

Fifteen years later Honoré finds himself in Rome again, but this time on his cellphone and in a rush to catch a flight home from Fiumicino Airport "silently cursing anyone who crosses [his] path at a slower pace" (Honoré, 2004:2). When he finally reaches the line at the gate, he reads a newspaper to keep himself busy, because he is unable to do nothing. This could arguably be the case for many people living an 'accelerated life'; it seems as though most people *do* live an accelerated life wherein the knowledge of how to do 'nothing' has been lost.

Time-chaser Carl Honoré describes reading the newspaper and his attention being drawn to an article called "The One-Minute Bedtime Story". It immediately presents itself as a solution to a problem he is currently having. His son complains that his father reads too fast or that he wants to hear more stories, while Honoré chooses the thinnest books to read as quickly as possible in order to get back to work. The one-minute bedtime stories provide a solution in the sense that a parent can read more than one story at a slow pace and still finish more quickly in comparison to having read even the thinnest book (Honoré, 2004:2). Upon this realisation, however, Honoré begins to think and he realises what a hurry he has been in, forever attempting to do more, but in less time:

> "My whole life has turned into an exercise in hurry, in packing more and more into every hour. I am Scrooge with a stopwatch, obsessed with saving every last scrap of time, a minute here, a few seconds there. And I am not alone. Everyone around me – colleagues, friends, family – is caught in the same vortex" (2004:3).

The term "time-sickness" was coined by American physician Larry Dossey in 1982 to describe the idea that time is running out, leaving victims of this condition to play catch up all the time. In his book *Thank You for Being Late: The Optimist's Guide to Thriving in the Age of Acceleration* (2016) Thomas Friedman refers to John E Kelly III saying that as humans we live in a world where time, velocity and distance are experienced as linear, and yet the curve of technological development is exponential. Our only experience of exponential, according to Kelly, is "when something is accelerating, like a car, or decelerating really suddenly with a hard braking" (Kelly in Friedman, 2016:4). He says that such a moment may be experienced as exhilarating, but we would not want a long journey to be filled with such moments, "yet that is exactly the trip we are on" (Friedman, 2016:4). Many people experience the feeling of "always being in this state of acceleration" (Kelly in Friedman, 2016:4).

Founder and president of the WEF (World Economic Forum), Klaus Schwab, stated that "we are moving from a world in which the big eat the small to one in which the fast eat the slow", emphasising the increasing need for speed in the fight for survival (in Honoré, 2004:3).

Acceleration is everywhere.[32] Yet, this need for speed is increasingly being questioned and countered by a consequential and oppositional need for Slow. Friedman says “Thank you for being late”, because if someone is late for an appointment, he wins a moment where he is allowed to do nothing, to reflect, and simply to be (2016:5).

Looking back at 19th century protests against speed, it becomes clear that this is not a new concept[33] or struggle. Individuals “looked for ways to preserve the aesthetics of slowness in the machine age” (Honoré, 2004:12). Although not a new concept, perhaps today the need for Slow is simply becoming more urgent than ever before. The rise of the Slow Movement is proof of increasing support for a different way of being, against the cult of speed, a way of being other than being in a ‘quick-fix’, profit-driven society where even “instant gratification takes too long” (Fisher in Honoré, 2004:11). It is against this backdrop that I embark on my investigation into time and creating art as a process of taking time and measuring time.[34]

---

[32] An interesting modern phenomenon, as an example, is the shrinkage of average shot length (ASL) of mainstream films (a shot refers to an uninterrupted series of frames in a film. In other words, a shot represents what is recorded in one take). In early cinema entire films would often consist of a single shot meaning shot lengths had fairly long durations (Bordwell & Thompson, 2008:208). The average Hollywood feature film between the 1930s and 1960s had an ASL of eight to eleven seconds (Bordwell, 2002:16). Cutting rates continued to increase and movies in the 1980s would normally have an ASL of between five and seven seconds (Bordwell, 2002:17), while around 2014 the average ASL could be measured at about four to six seconds. Today it is not uncommon to find an even faster average rate of about three seconds per shot in action movies (Koepnick, 2014:152).

[33] With the development of steam locomotives critics believed that the human body would melt when travelling at a very high speed while others were concerned that women’s uteruses would fall out of their bodies if accelerated to high speeds like 50 miles an hour (Burns, 2015).

[34] Time is an integral part of my practical work and an important contributor to the aesthetic outcome. I think of time as a medium with which I work and through my other materials I also explore the materiality of time.

3.2 Definitions of Time

Below is a quotation from the novel *Einstein's Dreams* by Alan Lightman (1993). It gives a fictional account of what the German-born theoretical physicist Albert Einstein might have dreamed about when working on his concept of time:

> "In this world, there are two times. There is mechanical time and there is body time. The first is as rigid and metallic as a massive pendulum of iron that swings back and forth, back and forth, back and forth. The second squirms and wriggles like a bluefish in a bay. The first is unyielding, predetermined. The second makes up its mind as it goes along.
>
> Many are convinced that mechanical time does not exist. When they pass the giant clock on the Kramgasse they do not see it; nor do they hear its chimes while sending packages on Postgasse or strolling between flowers in the Rosengarten. They wear watches on their wrists, but only as ornaments or as courtesies to those who would give timepieces as gifts. They do not keep clocks in their houses. Instead, they listen to their heartbeats. They feel the rhythms of their moods and desires. Such people eat when they are hungry, go to their jobs at the millinery or the chemist's whenever they wake from their sleep, make love all hours of the day. Such people laugh at the thought of mechanical time. They know that time moves in fits and starts. They know that time struggles forward with a weight on its back when they are rushing an injured child to the hospital or bearing the gaze of a neighbor wronged. And they know too that time darts across the field of vision when they are eating well with friends or receiving praise or lying in the arms of a secret lover.

> Then there are those who think their bodies don't exist. They live by mechanical time. They rise at seven o'clock in the morning. They eat their lunch at noon and their supper at six. They arrive at their appointments on time, precisely by the clock. They make love between eight and ten at night. They work forty hours a week, read the Sunday paper on Sunday, play chess on Tuesday nights. When their stomach growls, they look at their watch to see if it is time to eat. When they begin to lose themselves in a concert, they look at the clock above the stage to see when it will be time to go home. They know that the body is not a thing of wild magic, but a collection of chemicals, tissues, and nerve impulses. Thoughts are no more than electrical surges in the brain. Sexual arousal is no more than a flow of chemicals to certain nerve endings. Sadness no more than a bit of acid transfixed in the cerebellum. In short, the body is a machine, subject to the same laws of electricity and mechanics as an electron or clock. As such, the body must be addressed in the language of physics. And if the body speaks, it is the speaking only of so many levers and forces. The body is a thing to be ordered, not obeyed.
>
> […]
>
> Where the two times meet, desperation. Where the two times go their separate ways, contentment. For, miraculously, a barrister, a nurse, a baker can make a world in either time, but not in both times. Each time is true, but the truths are not the same" (1993:18-21).

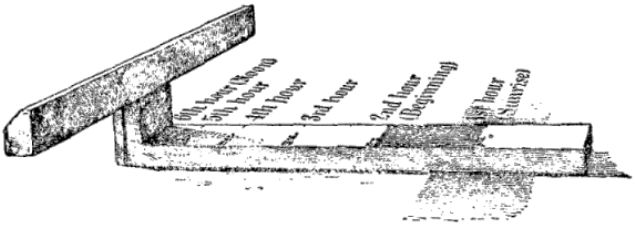
On personal reflection, I do not wear a wrist watch, but I surround myself with clocks. In my studio I have a little red alarm clock standing on my

desk. In my kitchen at home there is a large wall-mounted clock and in my bedroom I have a wall clock and a black triangular alarm clock. In the bathroom my grandfather's old fashioned wind-up alarm clock stands still at five minutes to four. Wherever I go and whatever I do, I can always check the time. Checking the time allows me to position myself. As Honoré writes, "the clock gives us our bearings, telling us not only where we stand vis-à-vis the rest of the day, but also how to respond" (2004:17). The clock drives our actions and allows us to move slightly slower when we are on time, or nudges us to get a move on when we are late. As Woodcock states, the clock is the dictator of our actions (1944:65). Before we can begin to understand the different definitions of time, it is perhaps important to firstly investigate the human obsession with time.[35]

Even before mechanical clocks developed, societies around the world developed their own systems for measuring time. Many of the ancient cultures kept a record of the cycles of the natural world through the creation of calendars (Honoré, 2004:18). They tracked years, months and days by observing the changing seasons, the movement of the stars and the rising and setting sun (Birth, 2012:2). Progressively, the instruments to measure the passage of time were tweaked to break months and days into smaller units: hours and later minutes and seconds (Birth, 2012:2-3).

[35] The human obsession and fascination with (or dependence on) time is perhaps far more deeply imbedded in our understanding and organisation of daily life than we realise. There are records of artefacts from pre-historic times that seem to indicate systems of time measurement, for example dating back to the Neolithic Era that began around 15 200 B.C. (Applegate & Zedeño, 2001:463). Time-keeping in pre-history typically had the objective of tracking the solar year, but the calendar that has officially been named the "world's oldest calendar" is a lunar calendar structure found in Scotland consisting of twelve pits in a field that appear to track months by mimicking the phases of the moon (Gaffney *et al.*, 2013). This structure seems to have been made by hunter gatherers and dates back to a Mesolithic Era around ten thousand years ago.

Sundials were used to measure hours, with the oldest sundial dating back to 1500 B.C. [Fig. 14] (Dame, 2007:1). Over the following two millennia a variety of tools were used to track the passage of time, from burning candles to oil-lamps to the very early water clocks [Fig. 15]. In the 13th century the first mechanical clock was invented and systematically improved upon to become more accurate as the years progressed (Honoré, 2004:18).



OLDEST SUNDIAL EXTANT

Egyptian specimen, restored after Borchardt, now in the Berlin Museum. Dates from *c.* 1500 B.C. In the morning the crosspiece was turned to the east, and in the afternoon to the west. From Breasted's *Ancient Times*

Fig. 14. Egyptian sundial, c. 1500 B.C. (Smith, 1958:50).

With the development of the clock came the opportunity to draw up schedules (Honoré, 2005:18). The first clock towers and public clocks were installed in city centres around Europe in the 14th century. The influence of the ability to measure time on the way people structured their days and lived their lives is irrefutable. In 1374 the German city Cologne passed a law that outlined labourers' expected working hours per day (Honoré, 2004:20) with a specific start and end time and a lunch break

limited to one hour. Today it is difficult to imagine the average working day otherwise.

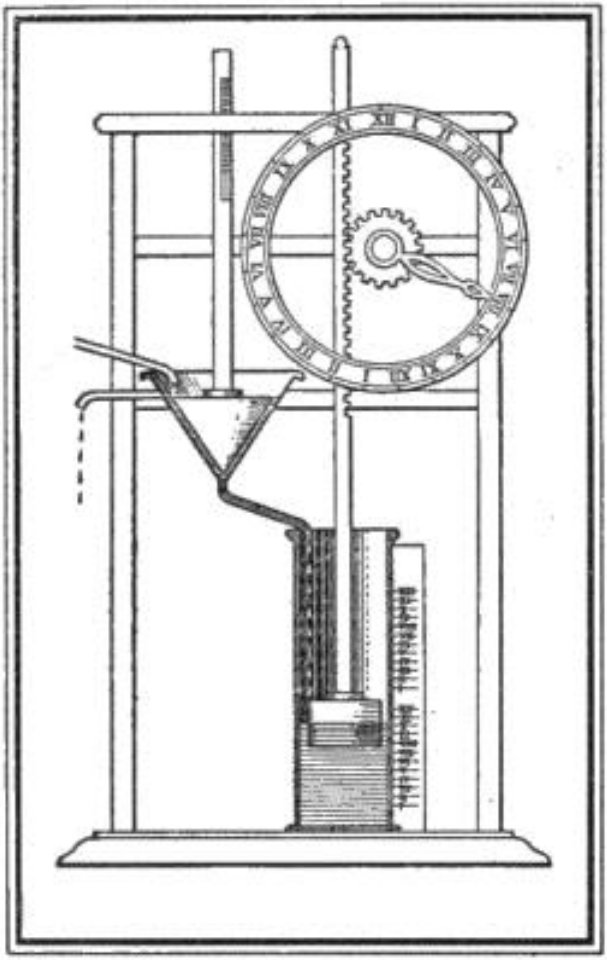


Fig. 15. Diagram of a water clock (or Clepsydra). (Brearly, 1919:55).

Importantly, with the ability to measure time came the opportunity to impose tighter control (Honoré, 2004:19). Before the development of the mechanical clock, actions were determined by 'natural time'; people would perhaps agree to meet at sunrise or sunset. At night a sundial would be useless, hourglasses could count down a length of time, but could not tell the hour. Time was a flexible concept dependent on nature.

The clock moved away from being a reflection of natural cycles and a means to measure time, however, and became an independent construct (Birth, 2012:2). The clock became an object with the authority to prescribe what had previously been recognised as natural, like when to eat or when to sleep. Clock time became segmented – running independent from the cycles of natural time. But more importantly, clock time, a creation of humankind, gained the ability to stop, start and manipulate the actions of its makers and users, breaking the flow of time, destroying natural time, resulting in a novel perception of what time is. "Clock time had the upper hand over Natural Time" (Honoré, 2004:20).[36]

The differentiation between clock time and natural time can be seen particularly in the introduction and development of standard time in the late 19th century. Standard time refers to the synchronisation of all clocks in a specific area to the same time, not depending on natural indicators like with the use of a sundial (for example, when it is midday). In 1883 railway companies were the first to employ standard time (Kern, 1983:12). A passenger riding the train from Washington to San Francisco in 1870

[36] Birth emphasises the separation between natural cycles and clock time when he states that "one does not need to know the mathematics and astronomy that went into our current standards of time measurement in order to know the time; instead, all one needs to be able to do is properly interpret the output of these artefacts" (2012:8).

would have to set his watch two hundred times if he were to update according to every town's local time (Kern, 1983:12). Railway lines attempted to place towns in categories according to regions, yet the number of zones passed through on one extended trip were still vast until the town of Greenwich in London, England, was established as the zero meridian at the International Meridian Conference hosted in Washington DC in 1884 (Kern, 1983:12). The earth was divided into twenty-four time zones an hour apart, based on the exact length of each day. At the conference, the exact time that each day in any country in the world begins and ends was determined, confirming the rupture between mechanical clock time and natural time. Time became designated by the clock instead of the clock being a tool to keep track of the natural passage of time, for example, between sunrise and sunset. As such, time became a construct that existed as an entity in itself, consisting of small units with the power to prescribe.

In my art practice I take note of the beginning and end of a work session as a means to measure time. My actions are momentarily dictated by the clock, but as I weave I aim to let go of my consciousness of clock time and allow myself to experience another type of time. Perhaps this time could be measured in the fragmented process of weaving paper strips. Because of its fragility the paper can't be woven in a rhythmic fashion replicating either clock time or natural time; instead the process stops and starts with breaks and tears and only occasionally I manage to work with some sort of natural flow. In this process I work through the experience of time as something seen on the clock as well as something revolving around natural rhythms. My process allows me to think of time as a multiplicity instead of a uniform phenomenon.

The implementation of standard time gave rise to the development of methods and apparatuses used to signal a uniform time to the whole planet. The notion of time as non-uniform can be attributed to influential philosophers like Henri Bergson (1859 – 1941) in France and Edmund Husserl (1859 – 1938) in Germany contemplated the complex and elusive nature of time.

In 1687 the English mathematician, astronomer and physicist Isaac Newton (1643 – 1727) [37] said about time that: "Absolute, true, mathematical time, of itself, and from its own nature, flows equally without relation to anything external" (Newton in Kern, 1983:11). He believed that time existed external to the universe and perception and that it will continue to exist even if the universe were void of all objects and matter. His idea of time saw an overlap in mathematical and natural time as something pure and perfect.

In 1781 Newton's idea of time was rejected by German philosopher Immanuel Kant (1724 – 1804), who posited time as the intuitive – yet universal and *a priori* – foundation for all experience (Kern, 1983:11). He explained that we could not understand phenomena without time, but we can think of time void of phenomena. Although these two theories of time differed vastly, what they do have in common is that time is the same for everybody (Kern, 1983:11). Time was regarded as an almost celestial construct that is presented to us (either in spite of our experience or as a foundation for our experience). The homogeneity of time remained largely

[37] Isaac Newton is probably the most well-known proponent for absolute time, but certainly not the only one. Many of his ideas regarding absolute time had been introduced by Isaac Barrow (1630 – 1677).

unquestioned[38] until the late 19th century.

Henri Bergson's theory of 'duration' is explained in his book *Time and Free Will: An Essay on the Immediate Data of Consciousness* (1910). He writes that our "immediate data of consciousness" is temporal and can be described as *la Durée* (duration), which is a qualitative multiplicity rather than a quantitative multiplicity (Bergson, 1910:85).

A quantitative multiplicity enumerates things (or states of consciousness); it is objective, homogenous, mechanical and measurable, like clock time with units of seconds, minutes and hours (Bergson, 1910:107). Measurable clock time established itself as the most common perception of time (given the needs of industrialisation and the development of modernity with its affiliation toward activities such as measuring and categorising). Yet Bergson prefers to look at time as a dimension where lived experiences flow from one into the next, and, as a realm in which free will can be found (1910:120). Bergson did not believe that time should only be defined by the segments that people suggest and impose. Time as duration or as a qualitative multiplicity is subjective, heterogeneous, and also infinite, creative and understood as indivisible 'lived' time that is inextricably linked to human experience (Bergson, 1910:120).

From his phenomenological perspective, Edmund Husserl further investigated human consciousness, which he believed makes possible a unified perception of time. He expands on Bergson's differentiation

[38] *The Life and Opinions of Tristram Shandy, Gentleman* (1759), a novel by Laurence Sterne, questions the heterogeneity and linearity of time through its distinction between private and public time and the moving back and forth between times.

between objective/quantitative and subjective/qualitative temporality,[39] but proposes the addition of intentionality through consciousness and self-consciousness (Bernet *et al.*, 2005:251-252). On the (seemingly) objective side, he describes a perceived object or primal impression as it exists in time and space without meaning and connotations ascribed to it, while the subjective side involves the contents of the object to be interpreted as well as the act of this interpretation (the latter relates to self-consciousness and consciousness of time through internal lived experience) (Bernet *et al.*, 2005:251-252).

For Husserl, the source of time is a series of primal impressions, each experienced at the present moment, but not in isolation from all the moments surrounding it (Swan, 2016). A primal impression or now-moment is linked to the immediate past and future through 'retentions' (present moments fading away but retained in our consciousness) and 'protentions' (anticipated future moments) (Bernet *et al.*, 2005:44). Any primal impression is also linked to the distant past and future through recollection and expectation (Bernet *et al.*, 2005:44). Retention-protention (or primary memory) is continuous, whereas recollection-expectation (or secondary memory) is discrete (because the present now-moment is interrupted to recall or anticipate these further-away moments) (Swan 2016).

For Husserl consciousness is connected to internal lived time and the contents to be interpreted rather than to the perceived object. Internal lived experience does not encompass self-awareness and therefore the

[39] According to Richard McKeon the differentiation between time and temporality can be described as "time and the circumstances in which time is perceived as a problem or as a structure" (1974:124).

addition of intentional consciousness is integral to our experience and to making sense of the world (Kelly, n.d).

Human experience is constantly being conditioned by mental or internal processes, for example, of anticipation, recollection and the taking in of impressions. Temporality includes an awareness that determines the duration and sequence of the aforementioned mental processes, as such enabling these processes to be regarded as temporal. Consciousness can be applied to comprehend and distinguish between the neutral object (before meaning has been ascribed to it) and the object with meaning (Bernet *et al*., 2005:251). In both Bergson and Husserl, it is clear that the subject(ive) plays a more prominent role in time perception than the object(ive).

Philosopher and economic theorist Melanie Swan suggests that today and for the future we nevertheless need *a new time*. Swan differentiates between "compute-time" and "human-time", in relation to what has previously been noted as objective world time and internal lived time (2016). Her suggestion is that we should move beyond these conceptions of time to find something more adequate for the future (Swan, 2016). Swan's proposition is a model of time that can be both discrete and continuous, objective and subjective, quantitative and qualitative, compute time and human time – a type of time that will overcome previous distinctions between machine and human time (2016).

Swan posits 'X-tension' as the missing middle concept of time that can metaphorically be understood akin to the concept of Schrödinger's cat,[40] where the cat in the closed box is simultaneously dead and alive until the

[40] The Schrödinger cat concept was designed to explain quantum theory, but is used by Melanie Swan as a metaphor to explain her idea of 'X-tension'.

box is opened and the state of the cat is revealed (Swan, 2016). Through this concept, time is not either objective or subjective. Instead, it is a 'raw material' that exists in a primordial state (of being both objective and subjective) until it collapses into a specific reality situation of either objective or subjective. This missing middle concept of time is arguably needed to link the different paradigms of time more closely.

Swan writes that 'x-tension' is perhaps also a more accurate portrayal of the experience of time, which can seem both discrete and continuous through the course of one lived experience. It is perhaps more important to focus on 'how it seems', rather than on what it really is, especially from a phenomenological perspective.

Considering a new idea of time could become useful as we move into an ever more digitally oriented age. We have and are constantly developing new technological tools that help us and even force us to look at time in a complex, nuanced and open-ended way.

Artist Nicholas Sagan suggests that the human conception of time is becoming posthuman (Sagan, 2010:25). He says that technology, in particular the internet, moves its human creator beyond physical space-time limitations and also pushes the psychological boundaries we might hold of conceptions of time (Sagan, 2010:26). Sagan uses the example of 'information sharing' to illustrate a shift in temporal consciousness. The development of the railway increased the speed at which information travelled and so did the telegraph and in turn the internet. These tools allowed for a significant time compression that allowed information sharing (and temporal consciousness) to transcend physical boundaries.[41]

[41] Further, Sagan writes that "the biological temporal framework of the individual is now a subject of thought more than matter" (Sagan, 2010:26).

Technology allows its user to exist not only in a personal temporal framework, but in more than one spatial-temporal framework. As a human individual, I can exist in a time-framework as and where I am, while also existing in time through my (virtual) experience of different spaces (i.e. I can exist in different measurable time zones through technology). Sagan uses the example of a stockbroker who works on a global scale and must be aware of the US market, but also the markets in London and Tokyo for example (Sagan, 2010:26). Because these cities are all located in different time zones, each function within a slightly different framework than the others. For the stockbroker to mentally exist in all three of these spaces implies a dependence on communication technology. This, for Sagan, is evidence of a paradigm shift away from biological existence and natural time towards a posthuman framework of time (2010:26).

3.3 Time Perception

Many of the greatest human minds have attempted to formulate a definition of time. As seen in the preceding section, this has not been without its challenges and still there is no concrete definition of time (apart from the common notion of clock time). Furthermore, it seems time theorists are consciously moving away from an idealistic singular definition of time towards an understanding of a multiplicity of times, and to relative time.

The human perception of time has been widely investigated in the fields of philosophy, psychology, neuroscience and cognitive linguistics. Time perception refers to the capability of measuring the passage of time fairly accurately from milliseconds to hours without the aid of a clock (Droit-Volet & Meck, 2007:505). Time perception is not a function of the brain that can be assigned to a specific part of the brain (Meck, 2005:1). The evidence that links certain parts of the brain to the functionality of measuring time

shows that humans do have a system (perhaps more than one) involved in this process, by which various parts of the brain are activated.

As discussed in the previous section, subjective time refers to internal, lived time. In this paradigm, time is understood according to an experience of time rather than according to knowledge about time. Although objective, measurable time is generally believed to move at a constant speed, it does not always feel constant; its forward flow is experienced relative to the observer's situation. Variables in the perception of time refer (for example) to the feeling of time passing too quickly or too slowly. These internal perceptions of time occur because of temporal illusions, or the distortion of time perception.

There are several causes of distortions in time perception, including drug usage, age, body temperature, chronic disorders and, perhaps the most common cause, emotional states (Droit-Volet & Meck, 2007:506). Our sense of time is influenced by emotion and not only determined by cognition. Sylvie Droit-Volet and Warren H. Meck, both experts in the fields of psychology and neuroscience, explain that when events capture our attention our focus is diverted away from our hypothesised internal clock, resulting in a decreased rate of the internal clock and an underestimation of the amount of time that has passed. As such, the subjective experience of time is shorter than the amount of time that actually passed (Droit-Volet & Meck, 2007:505). In other words, it feels as if time is passing more quickly when our attention is drawn away from the internal clock, because at that moment the internal clock is running slower than a real clock.

A decrease in stimulation will result in the feeling that time passed more quickly than it did. For example, with a very full schedule of to-do lists and appointments, our attention is diverted away from our internal time. We might think only twenty minutes have passed when in fact thirty minutes

have gone by. Our subjective experience of time is shortened, and upon realisation that a greater length of time has passed, we may get the feeling that time is passing too quickly. Clock time seems to be moving faster than our internal time (Droit-Volet & Meck, 2007:507).

Conversely, an increase in stimulation in the amygdala[42] (and an increase in the awareness of the internal clock) means an increase in internal clock speed and a lengthened subjective experience of time (Droit-Volet & Meck, 2007:505). The duration of time seems longer than it actually is and therefore it feels as if time is passing more slowly than it actually is. As an example, one can think of being in a threatening situation, and after having been faced with the emotion of fear, the situation is often recalled as something that took much longer than it really did (Droit-Volet & Meck, 2007:507).

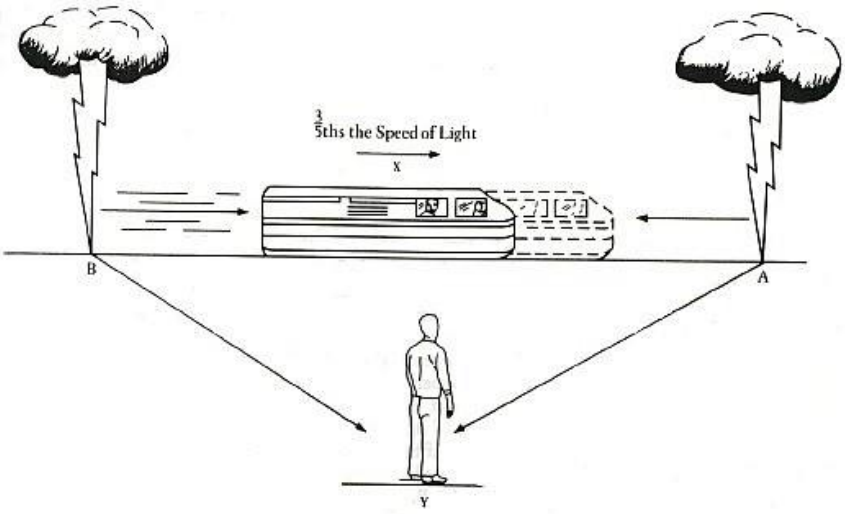
With this in mind, it is easier to understand that individuals can have entirely different perceptions of time even in the same situation. Two individuals may experience time as slow and fast, depending on their emotional state. As such, time can be seen as relative.

Albert Einstein (1879 – 1955) formulated the theory of relativity, with 'special relativity' specifically concerned with the relativity of time. In 1905 he published a paper entitled "On the Electrodynamics of Moving Bodies" in which he explains how time can be understood in very different ways,

[42] The amygdala is one of the nuclei located within the temporal lobes of the brain and is associated with emotional reactions (Adolphs, 2008:166). Although stimulation can be picked up in the amygdala there is no concrete proof that this part of the brain is associated with our perception of time (Meck, 2005:1).

depending on the observer's position in relative motion[43].

In his thought experiment explained in *Relativity: The Special and General Theory* (first published in 1916) Einstein illustrates that it is possible for one observer to see two events happening simultaneously, while another observer sees the same two events happening at different times, and both observers would be right (Einstein & Lawson, 2001:31-32).



In Einstein's special train example, the light from A will arrive at X before that from B. Hence X will observe the lightning at A as happening before that at B. Y, however, will observe the bolts of lightning to be simultaneous. This is an example of how observations from reference frames moving at great speeds relative to each other reveal a different timing of events.

Fig. 16. Train diagram explaining Einstein's theory of relativity. (Pine, 1989).

[43] Time dilation occurs because of relative motion. Einstein's theory on time dilation explains why clock time moves at different paces depending on where on earth you are or how (fast) you are moving in relation to earth. For example two synchronised clocks' time will vary if compared after one clock was flown around the world at a very fast pace (Pine:1989).

Einstein asks his reader to imagine an observer standing on a railway platform looking towards the rail when a train goes by [Fig. 16] (Einstein & Lawson, 2001:31). At the exact moment that the train's midpoint is in front of the observer, both ends of the train get struck by lightning. Both bolts of lightning strike at the same distance from the viewer and as such the light reaches his vision simultaneously (Einstein & Lawson, 2001:31). He correctly perceives that the two ends of the train were struck by lightning simultaneously.

If one imagines another observer sitting on the train at its midpoint, when the two bolts of lightning strike, the light from each bolt has the same distance to travel in order to reach the observer's eyes (Einstein & Lawson, 2001:31). In the same manner as the observer on the platform, the observer on the train will also understand the speed of light to be the same in either direction. However, the forward movement of the train means that the light from the back end of the train has a longer distance to travel to catch up and will reach the view of the observer moments later than the light from the front end of the train (Einstein & Lawson, 2001:31).

As such, the observer on the train says that the front end of the train was struck by lightning first and the rear end shortly afterwards. The second observer "who take[s] the railway train as their reference-body must therefore come to the conclusion that the lightning flash [A - at the front of the train] took place earlier than the lightning flash [B - at the rear of the train]" (Einstein & Lawson, 2001:32).

Albert Einstein explained that the speed of light is absolute and invariable, and proved that if this is the case, then time and space must be relative in order to accommodate this. Einstein's idea of relative time is very different from the subjective experience of psychological or philosophical time, but in both cases we are provided with ways to think of time as something

flexible, rooted in the observer's experience of, and position in any temporal occurrence.

3.4 Time and the Body

With the human observer or subject taking on an important role in this discussion, it seems appropriate to link time to the human body in a broader sense. We do not have access to clock time without our senses. Neither can we perceive the flow of natural time without our senses. We see ourselves age, we feel our bodies grow tired, we forget details of yesterday's events and even more so yesteryear's events, and we attribute these occurrences to the passage of time almost automatically.

Christine Cronjé obtained her MA in Visual Arts at the Michaelis School of Art (at the University of Cape Town) in 2014. She writes that time enables the passage from life to death and as such it is a type of threshold (Cronjé, 2014:52). Lewis Hyde states that "it is because of our consciousness of time that we are conscious of our mortality" (Hyde & Viola, 1997:164). The passage of time cannot be escaped, yet (and perhaps for that reason) we are desirous of a timeless and/or infinite life and infinite being. We wish for our bodies to transcend its seemingly inherent connection with the passage of time. But everything is experienced in time (Cronjé, 2014:52). On an everyday level we attempt to capture time through photography, art, poetry and status updates on social media. We wish to hold onto moments, yet these moments constantly and instantly move from our present to our past. Perhaps, therefore, we become fearful and anxious that time is running out. This emotion of fear is a bodily reaction associated with time that we experience through perception and through our bodies.

The French phenomenologist Maurice Merleau-Ponty (1908 – 1961) asserts that experiences cannot be separated from the perceived or

performed passage of time. Our idea of time is seen as a "dimension of our being" (Merleau-Ponty, 1962:421). The notion of time is intrinsically linked to our material bodies and Merleau-Ponty regards the world as a whole to be part of our bodies; not separated by a clear distinction. He explains that,

> "[v]isible and mobile, my body is a thing among things; it is one of them. It is caught in the fabric of the world, and its cohesion is that of a thing. But because it sees and moves itself, it holds things in a circle around itself. Things are an annex or prolongation of my body; they are incrusted in its flesh, they are part of its full definition; the world is made of the very stuff of the body" (Merleau-Ponty in Toadvine & Lawlor, 2007:354).

If "the world is flesh" (Merleau-Ponty, 1968:138) and time can be seen as a part of the world, then time must also be flesh, meaning that it is also part of our bodies. By this definition, it seems that time is not necessarily experienced subjectively, but is perhaps rather constituted as part of the subject. I think of my machine as an extension[44] of my body and *vice versa*, but perhaps I could also consider time as a part of my body, over and above something I experience through my body.

3.5 Time and Practice

"Temporality and Public Art" (1989), an article by Patricia Phillips, refers to the contradictions in what is valued and desired in society. She explains that there is a need for steadfast permanent art and simultaneously a precondition for art to be contemporary and timely (Phillips, 1989:331). Art must be a reflection of its era, it must be current, but art must also last

[44] The idea of machines, technologies or objects as aspects of the self is further discussed in Chapter Four.

outside of a specific period, even forever. Phillips talks about the contradictions in public art and public life, especially with regards to permanence versus fleeting moments (1989:331). When referring to public art, she says that it "requires a more passionate commitment to the temporary" (Phillips, 1989:331). Artists engage with the notion of time in different ways, sometimes aiming to create the almost infinitely durable object, while on the other hand, many artists choose to disregard durability for the sake of the concept or intention behind the artwork, project or performance. In the work of Olafur Eliassen we see a commitment to the temporary. Although there is documentation of his artworks, they exist primarily as installation pieces that can be best experienced as such.

One of his artworks titled *Your Strange Certainty Still Kept* (1996) plays with the idea of the present moment and even our perception of time as a series of absolute moments [Fig. 17].

> "*Your Strange Certainty Still Kept* 1996 comprises a thin curtain of water continuously falling from a perforated pipe on the ceiling of a dark room. The water drops are alternately lit by a series of pulsating strobe lights, which capture the droplets in seemingly static instants. In this installation the normal perception of time is disrupted" (Cronjé, 2014:54).

The viewer gains the sense of an 'absolute present' or of time standing still (Cronjé, 2014:54). Through artistic practice artists have the opportunity to experiment with time, to challenge both the maker's and the viewer's perception and ideas concerning the notion of time.

Fig. 17. Olafur Eliasson. 1996. *Your Strange Certainty Still Kept*. Installation with water, pump, strobe lights, foil and wood. Dimensions Variable. (Cronjé, 2014).

An example from my own art practice, an experiment entitled *Timer 00:05:05*, helps me to illustrate some thoughts around the seeming accuracy or inaccuracy of time perception in relation to my internal clock. The artwork is a sound piece, a recording of my finger tapping (counting seconds) on a table top. Without the aid of an actual clock as metronome, I inevitably lost the rhythm of clock time as I progressed through the session. However, I was surprised that the five minutes I tapped out turned out to be five minutes and five seconds, a fairly accurate account of clock time.

Rachel Carrico suggest that our fingertips[45] can be seen as a "corporeal site of temporal interfacing" that allow us to keep track of time by counting, but, she says that "while counting on our fingers may systematically mark the passage of time […] our digits also hold the potential to powerfully disrupt our perception of time's forward motion" (2008:1).

On the one hand each tap of my fingertip on the table can be thought of as a moment that momentarily freezes the forward flow of time, and on the other hand each tap can be thought of as exploding out of the forward flow of time relating more closely to an unbound time rather than a linear sense of time (Carrico, 2008:9). Yet one cannot truly place oneself out of the forward flow of time and as such it is better to "grasp that the flow cannot be grasped – for it will slip through one's fingers – [the flow] can be experienced only in the snap, tick and tock" (Carrico, 2008:9). Through the process of weaving and by tapping time on a table top I do not mean to take control over time. Instead, my hope is simply to experience time; to

[45] According to Rachel Carrico our fingertips are similar to our "eyes (as in the penetrating gaze) and our mouths (as in the voice)" in that they have performative abilities and extend beyond our bodies by blurring the boundaries between internal/external and self/other similar to Roland Barthes' "subtle beyond" (2008:2).

see what it does and how it can be perceived (perhaps as something not distinctly separated from my 'being').

The mechanical clock 'dictator' is widely recognised as a source of stress and anxiety, or at least, it is a reminder of stress and anxiety originating from elsewhere. It is important to note that the clock can also be personified as an object with the ability to orientate its viewer/follower and give a sense of direction and comfort. A world guided by the clock could also be a "world of consolation" in the sense that knowing the time and allowing the clock to move at its continuous pace could be calming rather than causing an upset as happens when one is constantly fighting against time (Lightman, 1993:28). Allowing the clock to lead our actions could be seen as similar to allowing natural time to lead our actions, as a relinquishing of the desire to control what one could never control.

In my own art practice I aim to let go of this desire to control, the desire to be ahead of time, while in fact constantly falling behind. My practice is largely based on the act of weaving paper, which is a fragile and time-consuming process, more so than weaving with thread. When I focus entirely on the activity at hand, my awareness of time fades and what remains is a sense of presence, of experience outside of clock time, perhaps in natural time (or internal to my own sense of time).

Recording my weaving process and displaying the video material [Fig. 18, 49-54, 56-56]. at different rates and from different angles could provide an example of the artistic use of relative time. The viewer is confronted with my weaving process, but it is difficult to tell which video is displayed in synchronisation with clock time, and which is perhaps slower or faster. Seeing me in the act of weaving could shed light on the accuracy of the video footage and possibly enhance the experience of time as relative and subjective. As further discussed in Chapter Five, performance artwork

often allows the viewer or participator to experience a different time, a time that is only possible within that experiment and that moment.

Time as a concept has been experienced and explained in such various ways by different individuals. I find the multiplicity of times an accurate observation when thinking of my own experience of time in different situations. The constant forward movement of clock time, however, still always offers me a sense of direction and perhaps also consolation.

Fig. 18. Marguerite Roux. 2017. *In Time.* Performance.

Sometimes I try to work against the clock, to outrun it, resulting in an ambivalent stance toward this complex object of time. Hence, sometimes I find a need to turn away from the clock, to pause and experience another type of time, a time that is not divided into equal parts, a time that can go slower or faster, and a time that restores my faith in the mystique of both the concept of time and its mechanical counterpart, the clock.

CHAPTER FOUR: THE MACHINE-BODY

I use the term ‘machine’ to refer to a piece of equipment applied in doing a task through the use of power (be it electrical power or physical power – with no specification on the strength of force used). In most cases, when I refer to the machine I imply electronic, technological or digital machinery, but I also regard my weaving loom as a machine with different components that function through the exertion of power. In this chapter I aim to provide an understanding of what I mean by the machine-body through looking at aspects of the relationship between humans and machinery.

In my art practice the weaving loom functions as a machine that enables me to investigate notions like time, and to specifically consider the clock, a machine in itself. Industry and industrialisation play an important role in my investigation of both time and production, and also as something that influenced the relationship between human and machine.

As seen in the previous chapter, human perceptions of time have been radically influenced by technological clock time. In the following pages I further deliberate on the influence of technology on time perception/experience. I mention how we attempt to ‘cut time’ and manipulate time for the sake of production and how the role of the human hand in production has been altered for the sake of saving time and as a result of the use of machinery.

In my investigation on the relationship between the human subject (body) and the machine I discuss the machine as an imitation and extension of the body. I further contend that the body can also be seen as an extension of the machine, especially as a ‘cog in the machine’.

4.1 Industry and the Machine-body

"The clock never stops, never stops, never waits" sings Ben Folds (2001), a sentiment explored by artists and felt by many throughout history. It is a perspective expressed in the film *Modern Times* (1936), written and directed by Charlie Chaplin [Fig. 19], in which he plays the lead role as a factory worker. He is part of an assembly line, where his role is to tighten bolts onto pieces of metal (presumably pieces of machinery). From the control room, frequent orders are given to the operator to increase the speed of the conveyer belts (carrying the pieces of metal). As a result, the production pace of the workers on the assembly line forcibly increases, allowing no room for a human slip even as minimal as the time it would take to sneeze. The Little Tramp (Chaplin) is so overwhelmed by the machine work that he becomes machine-like himself, walking along with jerky, staccato steps as if his own body is a set of gears in need of oil. At some point he literally gets pulled into the machine, metaphorically obliterating the border between his body and the machine. Francis Picabia said that "the future is a monotonous instrument" (2007:303), which could have been exactly what the Little Tramp (and real-life factory workers) experienced (and still experience), when repeating one action for hours on end.

This situation in the film presents an informative (albeit comical) portrayal of the 'machinic'[46] conditions factory workers endured during the rise of

[46] For Deleuze and Guatarri the machinic assemblage refers to the multiplicity of a body that is no longer dependent on internal identity but rather on the "assemblages it forms with other bodies" (Malins, 2004:84). The body as a machinic assemblage does not necessarily refer to an assemblage with technological machine bodies. In contest of this thesis I specifically use the term 'machinic' to refer to the possibility of assemblages formed between human and machine bodies or more simply as bodies relating to or resembling machines.

industrial capitalism. The film further gives insight into the concept of time shaped and structured by people in positions of power so as to increase efficiency, lower costs, and keep up with the competitive and growing commodity market.

Fig. 19. Film still of Charlie Chaplin in the film *Modern Times.* 1936.

With the development of the clock an ever more rigid system of control (including over the output of labourers) was put in place (Honoré, 2004:19). As mentioned in Chapter Three, the clock had the function of controlling and prescribing human action. The use of the clock in factories during industrialisation is a prime example of the manipulation of time for the sake of boosting production. An awareness of time was forged into the minds of people previously only aware of time as an abstract, somewhat hazy

concept, measured by sundials or hourglasses or other natural rhythms (Honoré, 2004:19).

Industrialisation was initially dependent on the provision of huge amounts of submissive labour. The Gale Encyclopedia of U.S. Economic History explains that workers were expected to labour around the clock, with typical work days being at least ten hours, but often much more, for six days a week (2000). Every minute counted, as did every hour and every day. More production meant more money and hence time was of the essence to reach optimal productivity. Women labourers were often paid less than men, and children even less (Gale Encyclopedia of U.S. Economic History, 2000). Yet, most of the time the labour supply easily met the demand from factories and as such labourers had no bargaining power even with the rise of labour unions.[47] The driving forces behind industrial capitalism were time and money. Industrialisation focussed on quantity, productivity, mass production over and above the quality of what was produced. Although workers spent many hours in the factory, not a lot of time was spent on doing each task, let alone doing it well. Each task that needed doing was done at high speed levels in order to move on to the next (but often exactly the same) task, and as such to increase production speed to produce the necessary surplus.

[47] In 1817 Robert Owen, one of the founders of socialism began campaigning for the eight-hour work day (Murphy, 1896:10). His proposition was that labourers should enjoy the same amount of time for themselves and for sleep as for work; thus the slogan “eight hours labour, eight hours recreation, eight hours rest” came to rise. It was only much later that these ideals started to become a reality. For example, the United Kingdom promulgated *The Factory Act of 1847* that restricted women and children working in factories to work only ten hours a day (Hopkins 2013:37). After many protests, marches and “Eight Hour Leagues” unions started to win the battle and factories started implementing the eight-hour work day (Fine, 1953:447). In 1938 with the *Fair Labor Standards Act* the United States standardised the eight-hour work day.

4.2 Work or Labour

> "If we are to understand the nature of practices such as building and caring for a house, preparing for a festival, tending a garden, decorating a Christmas tree, or proudly polishing one's automobile, we must restore the distinction between 'labour' and 'work' that has been lost since the advent of industrialization. We must look more closely at activities such as these, in which we are likely to develop emotional and imaginative attachments to things, and to care for them to a degree that belies their use or exchange value" (Willis in Maycroft, 2005:1).

Neil Maycroft reflects and elaborates on the ideas presented by Hannah Arendt in her book *The Human Condition* (1958) and later by Daniel Willis in *The Emerald City* (1999). These ideas specifically refer to human activities and how they should or have been understood. Arendt establishes the category into which visual art practices fall, but Willis, and in turn Maycroft, delve into art practices on a deeper level, especially positing theories of work and play as a foundation for the interrogation of creative processes. To situate the act of weaving in one of these categories, I look particularly at Maycroft's text.

Hannah Arendt differentiates between labour, work and action[48] as sorts of activities humans engage with (1958:7). She presents labour as an activity with the purpose of survival or to serve biological needs (Arendt, 1958:99). The products yielded from labour are not long lasting and because they are used up, new products of the same nature need to be

[48] The type of activity Arendt calls action entails both speech and action, and refers to the way in which humans disclose themselves to each other (1958:7-8).

produced. As such, labour is repetitive and cyclical and never reaches an end point (Arendt, 1958:20).

According to Arendt work, on the other hand, serves the purpose of creating durable products through a process with a beginning and an end (Arendt, 1958:153). These products are often utility objects, but Arendt explains that artworks are perhaps the most durable of objects, precisely because they are not used in general and therefore do not get worn down (Arendt, 1958:168).

At this point, questions arise in the consideration of ephemeral artworks, time-based[49] artworks and performance artworks, where the activity is not aimed at creating something that will last necessarily.

In *The Emerald City* (1999) Daniel Willis reiterates Arendt's idea that labour entails a process without an end focus, or where the product of labour can be used up (Willis, 1999:241). What we know as 'going to work' should rather be referred to as 'going to labour' (for most people), because the product resulting from our jobs can be used up and because there is a constant and repetitive element to labour that can also be recognised in our day jobs (Maycroft, 2005:2). We engage with this type of activity because of necessity, as a means to make ends meet (Willis, 1999:241).

As we know, the activity of work is directed at making a durable product, but Willis continues to explain that the activity of work could also be aimed at the construction of a 'world' (Willis, 1999:241). About this 'world' he writes that "beyond their immediate utility, human artefacts help to organise and structure our existence" (Willis, 1999:241). This 'world' is not

[49] Time-based work can be seen as opposed to results-based work. In time-based work the length of time spent on the process of making is regarded as more important than the result of the creative process. This topic is further discussed in Chapter Five.

necessarily a durable product, but could be a long-lasting idea or construct; the imaginative result of activity classified as work. Willis is of the opinion that the activities of (for example) a craftsman, chef or artist can also be seen as work, even if the artefact itself is not durable (Maycroft, 2005:3). As such, our definition of work and labour cannot primarily consist of the durability of the product created through activity. We should also look at the way the activity is structured and engaged with. An important factor to consider when defining activity as work or labour is the time spent on activities. This includes, for example, the experience of time, the organisation of time, the implementation of schedules, the authority over time and the quality of time (Maycroft 2005: 5).

Maycroft summarises that we can consider work as productive and imaginative activity, whereas labour is also productive (less so than work) but unimaginative activity (2005:4). Willis writes that labour "can be tolerated or justified only by virtue of its outcome - what it physically produces" (1999:244). A third category called 'play' can be described as imaginative but deliberately unproductive activity, making it an unsustainable activity (Maycroft, 2005:5).

Creativity or imaginative activity and the ability to both 'make' and 'make up' a world are vital in the activities of work (Maycroft, 2005:4). Both work and play can 'make' and 'make up' a world, but labour cannot, because laborious activity does not entail creativity (Maycroft, 2005:5). Laborious activities constitute linear and measured mechanical clock time that is removed from cyclical biological rhythms (Maycroft, 2005:5). Clock time is imposed on the labourer in spite of natural rhythms. The labourer's actions are dictated by clock time instead of natural time; lunch time, for example, does not take place when the labourer feels hungry, but rather when the

clock strikes one. Labour is associated with the production-driven, ‘time is money’, almost industrial approach to activities (Maycroft, 2005:5).

Fig. 20. Photograph of my studio alarm clock. 2017.

On the contrary, the time spent on activities that can be classified as work or play is under the authority of the person performing the activity[50] (Willis, 1999:248). In these two sorts of activities time is not defined and enforced by an external and imposed timetable. Instead, the person who works or plays creates a world and therefore “work time and play time create their own variable and unpredictable times, fictive times that have only an intransitive relationship with universal clock time'” (Willis, 1999:248).

[50] Maycroft explains that “those who willingly play an organised game clearly submit themselves to the time of the game and consequently a certain amount of clock watching is evident especially in competitive games” (2005:6).

Clearly, time is an important consideration. What kind of time is spent, and what is our relationship to time? Further, how does time affect what we make or produce in terms of quality? Can we say that more time spent per task equates to a job well done? On the one hand, the answer may be yes; it is necessary to spend time to ensure a job is well done. As an example, it is easy to conceive of a tired factory worker missing one or two bolts that should have been tightened, but slide away on the conveyer belt in the blink of an eye (as in the case of the Little Tramp). The factory worker has to be quick or he might slip up. In the latter case, it is clear that the quality of the product will be altered because of a lack of time spent on the tasks. In a factory, the option of pausing the entire production line to double check a few loose bolts on the product seems unlikely, but would certainly aid in ensuring a job well done. Perhaps slower, in general, is better (Honoré, 2004:12).

On the other hand, the answer could also be no; spending a lot of time to complete a task does not necessarily equate to a job well done. An aspiring artist can work on one painting for years, yet without the relevant skill set and without conscious learning throughout the process, the painting may still appear to be the work of an amateur after its completion. The time spent is not necessarily skilled time and the result does not necessarily reflect a job well done. Maybe slower is not always better.

In my own work, I spend many hours working on one task [Fig 20]. This raises the same question as above, about whether it is necessary to spend so much time on the task? Am I creating 'work', in Arendt and Maycroft's sense, if what I am making is nothing, or at the very best futile?[51] Yet, I

[51] The product or by-product and its function will be discussed further in Chapter Five.

attempt to do and say and explore something quite different through my process. My intention is not to complete a product and in this way ensure a job well done. On the contrary, I try to divert my attention away from the product, deliberately refraining from making a complete 'thing'. My focus is entirely on the act of making, on the process, rather than the product.

In an attempt to classify the activity of my practice, I refer to ideas of the ephemeral, of performance and process-based work in visual art practice. My practice is entirely process-based rather than results-based even though I engage with an activity that can traditionally be seen as a craft and/or a process in commodity production. My initial inclination was in fact to place my work within the category of labour, but this needs further thought.

Maycroft definitively presents art practices as work. It is described as productive, imaginative activity where the time needed for completion is not prioritised. The activity of work could be outcome-orientated, and labour is also productive, but it is unimaginative activity that is repetitive, standardised and process-orientated (2005:2-8). My weaving is productive, but process-centred, and enormously repetitive, potentially situating my actual activity at first sight largely as an activity of labour. However, Maycroft emphasises that artistic activities engaging with acts of labour are not necessarily labour, but rather activities of "work masquerading as labour" and conversely art-like products can be produced through the activities of labour, but it is important to recognise that these products are simply 'art-like' and not actually art (Maycroft, 2005:11).

The made object or by-product of my conceptual weaving practice is not the focus of my artistic activity, instead the process itself is the product.

Similarly, performance art or an “art happening”[52] may leave no product or by-product in its wake. But, even if the product is not materially durable, the artwork (albeit a process) is still “imaginatively significant and durable”, defining these types of activity as work rather than labour (Maycroft, 2005:11).

As in any factory situation, time is, however, still of the essence. In my case, importantly, time is not enforced by someone else, rather time is enforced by myself. I wish to metaphorically put myself in a situation of factory work in a sense, where the maker seldom gets to see the end product, or where the end product is not the responsibility of the hands tightening the bolts. The factory worker often had one repetitive task, similar to a cog in the very machine he is operating. Although my process is laborious, it is perhaps only a representation of labour, because the activity is not imposed on me (Maycroft, 2005:12).

Furthermore, my focus is not on the product, but on the time and the quality of the time spent. As such, it is necessary for me to spend many hours weaving, even without inspecting the outcome as a job that is well done or not, as my focus is on the process.

One could argue that weaving falls under another category called leisure time. Time is not something that is available in abundance and our activities are often controlled by a perpetual sense of running out of time, being late and spending time, as if it is money. Seemingly every action is scheduled to fall into a specific time slot, and even leisure time is given an

[52] The American painter Allan Kaprow (1927 – 2006) used the term ‘art happening’ to describe “pan-artistic phenomena, in which energies originally developing within the separate fields of painting, dance, music, poetry, etc., began to cross each other's paths at various and unexpected places” (Kaprow & Lee, 1966:281). These happenings came to describe events that can be considered artworks, art experiments or even performance artworks.

entry in the day planner. Willis suggests that leisure time is not critical of our conception that ‘time is money’ (1999:250). Although leisure time is unproductive and for that reason different from work or labour time, it is also the same as labour time in the sense that it is measured and meaningless (Willis, 1999:250). Leisure time is constructed by the same “temporal logic as labour” time rather than that of work (or play) (Maycroft, 2005:7).

According to Maycroft, art making cannot be classified as activities of leisure time (because the time of work and therefore of art practice is productive, immeasurable and meaningful in the sense that it can make and make up a world that is imaginative and durable), my own practice does bring me to question the ‘leisure’ or rather luxury of the opportunity to ‘take time’ and have time. Time has become like a commodity that can be “bought and sold like soap or sultanas” (Woodcock, 1944:65), something that is associated with wealth and class if ‘owned’ in abundance. I am critical of my own privilege as an artist to engage with activities of work rather than labour, a luxury in itself.

My labour will never be real factory labour. I do not physically understand the working conditions of industrialisation and I do not wish to replicate a Fordist production line. Yet, I nevertheless do attempt to focus on my interaction with the machine and on the process of working. This is something counter-intuitive for the traditional weaver (to not care as much about the tangible product or outcome). Anni Albers states that weaving is “an art discipline able to convey [an] understanding of the interaction between medium and process that results in form” (1965:21). My focus is on the medium as well as the process more so than on the form.

4.3 Human and Machine

Although my weaving is indisputably different from labouring under harsh factory conditions, I want to argue that in both cases the machine could be regarded as an extension of the operating body. In this section the relationship between human and machine is discussed with reference to technology as an imitation or rather extension of the body.

The relationship between humans and machines is a fascinating one that can be approached from a variety of perspectives. Although one could imagine the excitement around the development of machinery and an increase in accessibility of products, there was also a lot of resistance to the increased efficiency of the machine. For example, the Luddites in Northern England were textile workers threatened by a number of practices imposed during industrialisation [Fig. 21], amongst others, the development of power machinery (Thompson & Le Blanc, 1862:7). The things they were concerned about included the production of low-quality and cheap products on wider frames or mechanical looms like the stocking frame and steam looms (Thompson & Le Blanc, 1862:8). The mechanical frames caused concern because of its potential to replace skilled weavers. Another grievance was the low wages paid to the workers, because the system paying these low wages had no regard for the traditional wage agreement between masters and workers.

Their grievances seem reasonable, as many of these artisans managed to make a living supported by trade and craftsmanship. Not only did factory work enforce routines that were radically different from the routines dictated by natural cycles, it also alienated the makers/crafters/workers

from the process of making[53]. The Luddites had to take extreme measures to act on their concerns during what became known as the Luddite Rebellion (1811-1813).

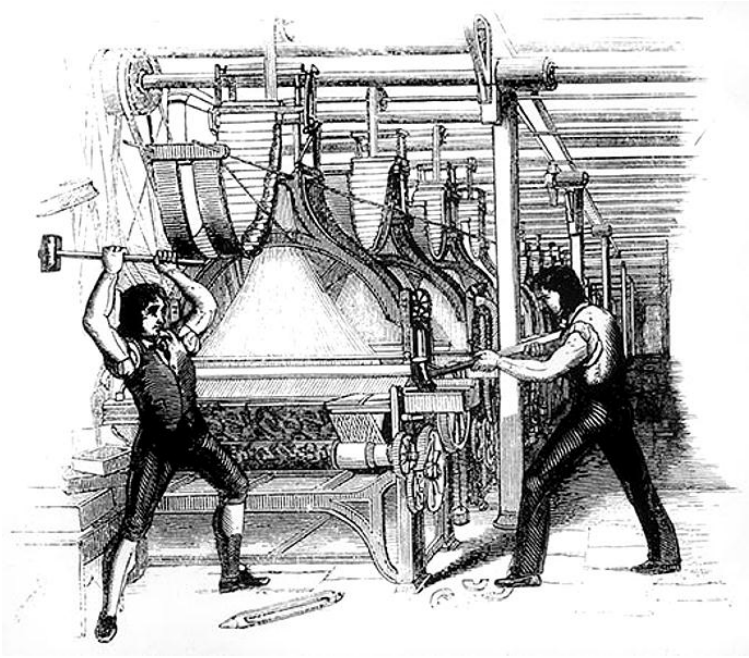


Fig. 21. An 1812 engraving from the *Penny* magazine altered at a later stage by adding two men to the scene to depict Luddite frame breaking. (Engel, 2014).

[53] Karl Marx (1818 – 1883) became known as the father of communism. In explaining the capitalist mode of production and its underlying patterns, Marx uses the concept of alienation in various ways; in one example from his *Manuscipts* (1844) he writes: “Just as in religion the spontaneous activity of the human imagination, of the human brain and the human heart, operates independently of the individual – that is, operates on him as an alien, divine or diabolical activity – so is the worker's activity not his spontaneous activity. It belongs to another; it is the loss of his self” (in Appelrouth, S. & Edles, L.D. 2008: 49). As used in this thesis the alienation refers to the estrangement of the individual from his essence as a result of economic class division and capitalist production systems.

The rise of the machine age threatened to turn craftsmen into mere factory hands. To a large extent the machine ultimately won the battle, but not without a fight. The Luddites engaged with breaking machinery in workshops and factories. Frames, specifically the new wide frames, were smashed and factories were burnt down. Their extreme activities led to the death of as many as fifty people (Thompson & Le Blanc, 1862:7-15).

If we fast-forward some two hundred years we find ourselves in an era where the machine has become familiar and a normal feature of everyday life. We can look back and consider how industrial capitalism changed people's lives. Today, factories play a massive role in our economic system, especially with an increasing demand for product distribution and the option of having everything (and anything) available in an instant. A seemingly endless supply of options and the amount of variety has taught consumers to expect endless possibilities. In turn, our demand for variety has encouraged increased production and commodification.

In the article "Art in the Information Age: Technology and Conceptual Art" (2002), Edward Shanken sketches the background of the development from machine-age technology to information technology, and against this backdrop explores the relationship between art and computers in the form of conceptual art – something that has been strongly differentiated from art-and-technology[54] (2002:436-437). Shanken references an exhibition called *The Machine: as seen at the end of the Mechanical Age*, held at the Museum of Modern Art (MoMA) in New York in 1968.

[54] In the most basic definition art-and-technology is an art practice that has the materials of science and technology as its main focus. In comparison conceptual art is more concerned with the underlying meaning and ideas in art making and the experience of art (Shanken, 2002:436-437).

This exhibition provided a platform for artists to showcase their understanding of the role machines played in daily life and it seems that the role and the influence of machines on the human psyche were questioned at the end of the mechanical age, on the verge of turning into the information or digital age, a revolution of progress and development (Hultén, 1968:266). This framework of constant development in technology evoked emotions of both fear and admiration. These contradictory[55] emotions were explored in art and showcased in exhibitions such as *The Machine*. Acclaimed museum director and art collector Pontus Hultén (1924 – 2006) organised this exhibition and in the official press release he writes that

> "[…] the machine – which can most easily be defined as an imitation of our muscles – is losing its dominating position among the tools of mankind [sic], while electronic and chemical devices – which imitate the processes of the brain and the nervous system – are becoming increasingly important" (1968:266).

Marshall McLuhan asserted (even in a pre-internet age) that electronic devices have certainly taken on a dominant role amongst the tools of humankind:

> "During the mechanical ages we had extended our bodies in space. Today, after more than a century of electric technology, we have extended our central nervous system itself in a global embrace, abolishing both space and time as far as our planet is concerned. Rapidly, we approach the final phase of the extensions of man [sic] - the technological simulation of

[55] Fear and admiration are emotions that seem to be contradictory, but they often go hand in hand; as in the case of devotion or admiration inspired by fear.

> consciousness, when the creative process will be collectively and corporately extended to the whole of human society, much as we have already extended our senses and our nerves by the various media" (1964:3-4).

According to Dr Francesca Ferrando (a specialist in posthuman philosophy), "the machine has turned into our companion species" (2013). We live in a world where there is an utter dependence on technology. In an artist's talk hosted by Carolyn Christov-Bakargiev with artist duo Janet Cardiff and Georges Bures Miller at the opening of their exhibition at Haus der Kunst in Germany in 2012, the topic of the space between technological and non-technological was raised by Christov-Bakargiev. She noted that this area is not a point of "conflict or rupture; for or against the machine", but it is rather a "greyzone where technology can be used to subvert its makers' intentions; not to disembody but to re-embody spectators", so as to ground the spectator rather than to take away from what the spectator experiences or perceives (2012).

As in the case of Charlie Chaplin, the functioning of the factory worker's hand is so structured and so contrived that he seemingly exists as a cog in the production machine itself. He becomes a metaphorical extension of the machine and similarly the tools he uses become an extension of him.

More than being a companion species, the machine can arguably also be seen as part of the human body, as multifaceted limbs. In Donna Haraway's *A Cyborg Manifesto* written in 1984, we are presented with a hybrid creature called the cyborg. Haraway writes that "by the late twentieth century, our time, a mythic time, we are all chimeras, theorized and fabricated hybrids of machine and organism; in short, we are cyborgs" (1991:150). She explains in more detail that "a cyborg is a cybernetic organism, a hybrid of machine and organism, a creature of social reality

as well as a creature of fiction" (Haraway, 1991:149) A cyborg is an android that is part biological and part artificial (rather than entirely artificial).

These, and similar types of hybrid bodies are often seen in science fiction films and literature, for example, in the 1982 film *Blade Runner*, or *Terminator* (1984) or *A.I. Artificial Intelligence* (2001) that I remember watching as a child and feeling an intense sadness for the robot boy who outlives the human species.

Apart from the physical amalgamation of human and machine as in the abovementioned examples, I want to argue that in our daily lives we have become so dependent on our machines that we are already extensions of our machines and *vice versa*. Adam Nocek is an Assistant Professor in the Philosophy of Technology in the School of Arts, Media and Engineering at the Herberger Institute of Design and the Arts at Arizona State University. He believes that the human self is not simply influenced by technology, but that an identifiable self emerges through technology (Broglio, 2016). There is no fundamental self to be influenced by technology, as we do not exist outside of our environments, outside of place and time, and therefore outside of technology. In a conversation between Nocek and Ron Broglio the question of whether we would think differently of ourselves if we had different technologies (similar to pondering on whether we would think differently of ourselves if we had different bodies) is raised and provides an interesting framework for my own thought (Broglio, 2016).

In response to these questions, I realise that by using both analogue and digital technologies these machines become aspects of my identifiable self. My body is not necessarily a machine and the probable future integration of humans and machines does not explicitly mean that the two bodies will merge, but my use and ownership of, for example, cellular

technology already points at a type of machine-body; a self that seemingly cannot exist without the detached, yet integral technological body part.

Thinking about the merging of human and machine bodies raises the important issue of uncertainties about the future of humankind,[56] such as the notion that technology is developing so fast that humans will not be able to keep up with the pace of change "unless [we] enhance [our] own intelligence by merging with the intelligence we have created" as Ray Kurzweil suggests in the documentary *The Transcendent Man* (2009). Urgent questions of this day and age also revolve around the point of speculating what humans may become when we can no longer make a clear distinction between human and machine intelligence.[57] For now, however, information technology could perhaps be thought of as a type of digital machine which cannot be excluded from its user's sense of self. In *The Birth and Death of Meaning* (1962) Ernest Becker writes:

> "A person is where he believes himself to be; or, more technically, the body is an object in the field of the self. It is one of the things we inhabit" (1962:32).

[56] Singularity, for example, or technological singularity is a concept that refers to the point where human and artificial intelligence meet and artificial intelligence surpasses human intelligence. Singularity includes the hypothetical runaway phase of artificial super-intelligence (Shanahan 2015: xvi). An artificial super-intelligence is an agent with intelligence far surpassing human intelligence, capable of self-improvement. If we reach a phase where an intelligent agent can improve itself, we as humans will no longer have control over the agent and this may result in unknowable changes to human life as we know it now. Singularity further includes the possibility of both human immortality or extinction (Shanahan, 2015:150).

[57] Although I cannot attempt to investigate all these questions, I do take note of the importance of thinking about the possibilities of the future and presently situating ourselves within the discourses on rapidly changing technology, even if our thoughts only make a basic shift to account for the machines we already use as part of our identifiable selves.

He continues to explain that “a person literally projects or throws himself out of the body, and anywhere at all” (1962:32) so that anything that he can call his own, even external to the body and mind, is what makes up the self. This notion resonates with the philosopher and psychologist William James’ (1842 – 1920) idea of the ‘material self’ as consisting of all the individual person’s belongings and everything the person belongs to (including, for example, the body, clothes, money and family)[58] (Gale, 2007:223).

The human self encompasses anything the relevant human identifies with as his own. According to this perspective, we can argue that the human self is also symbolically located in his/her technological devices. The device in this case (especially when not in use) is perhaps not a physical extension of the body, but indeed a part of the self. In this regard, I want to argue that my weaving loom is an identifiable aspect of myself. I would like to add that in making the loom myself, the link between my body and loom is strengthened.

Marshall McLuhan, the author of *Understanding Media: The Extensions of Man* (1964), would perhaps argue that the device when in use is indeed also an extension of the body and not only the self. Explaining McLuhan’s ideas, Tod Kappelman writes that an extension of the body occurs

> “when an individual or society makes or uses something in a way that extends the range of the human body and mind in a fashion that is new. The shovel we use for digging holes is a kind of extension of the hands and feet. The spade is similar to the

[58] William James (1842 – 1910) differentiated between different selves including the ’material self’, the ‘social self’, the ‘spiritual self’ and the ‘pure ego’. For further reading on this topic refer to the book *The Divided Self of William James* (2007) by Richard M. Gale.

> cupped hand, only it is stronger, less likely to break, and capable of removing more dirt per scoop than the hand. A microscope, or telescope is a way of seeing that is an extension of the eye" (2001).

Extension is useful in its support of human functioning, enabling us to overcome our natural physical limitations. The various parts of my weaving loom each enable me to do more than what I can do with my bare hands and is therefore not only part of my own 'self' but also an extension of my body.

4.4 Amputation

In my *Glitch* series of artworks [Fig. 22-24], consisting of woven strips of the telephone directory's Yellow Pages, I think about the role of the glitch in technological advancement. Often it is because of a faulty system or a lack in functionality, speed or simplicity that newer and better products are developed. The phonebook is one such example: a very useful tool that allowed us to have access to more numbers and addresses than we could possibly have had if we use only our own memory and knowledge, and that of the few people we know. The phonebook gave us so much information at our fingertips, but with the phonebook there is no need to ask a friend for someone else's address or number, and there is no need to memorise a string of phone numbers; the communication and memory skills involved in these activities are metaphorically *amputated*.

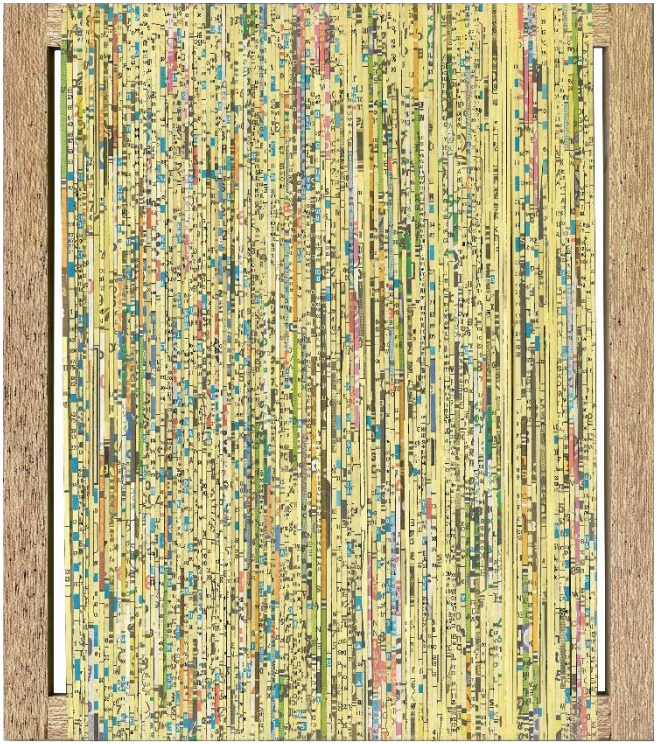


Fig. 22. Marguerite Roux. 2016. *Glitch I*. Woven Phonebook Paper and Wood. 31 x 27.5 x 1.5 cm.

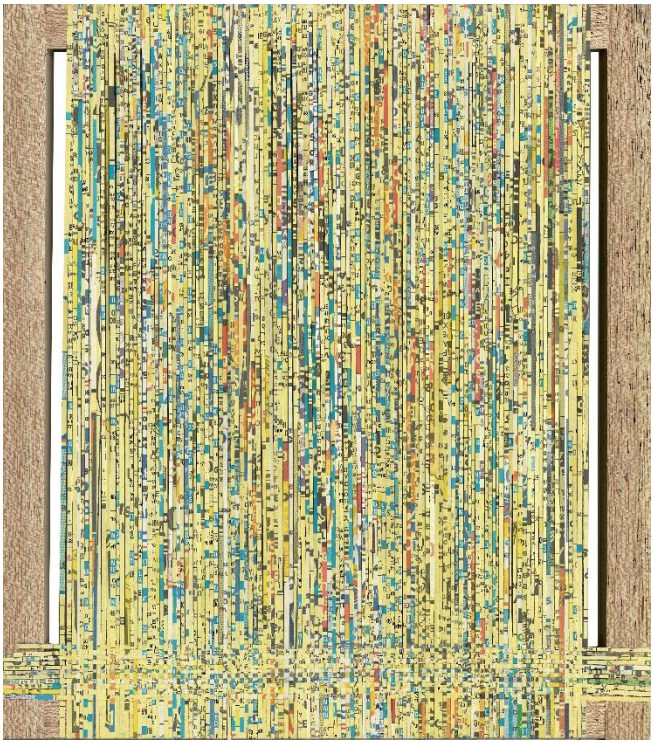


Fig. 23. Marguerite Roux. 2016. *Glitch II*. Woven Phonebook Paper and Wood. 31 x 27.5 x 1.5 cm.

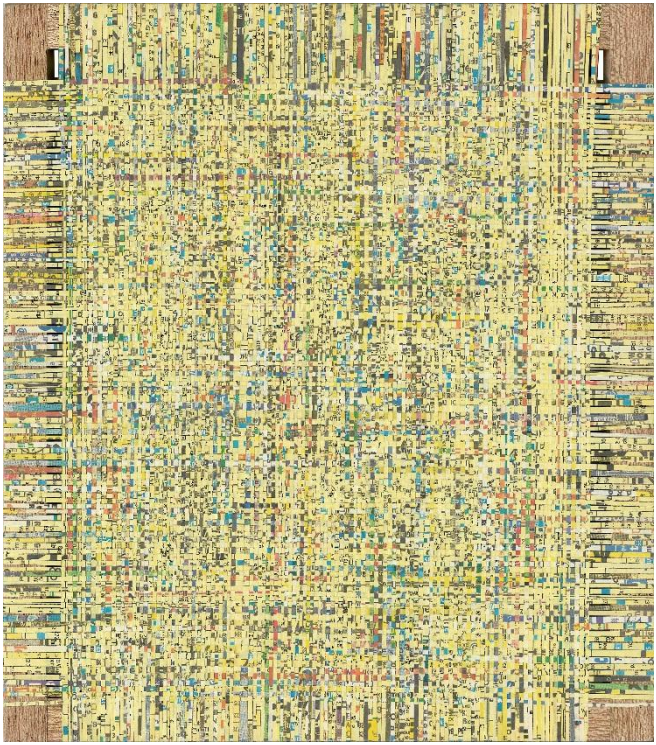


Fig. 24. Marguerite Roux. 2016. *Glitch III*. Woven Phonebook Paper and Wood. 31 x 27.5 x 1.5 cm.

McLuhan explains that through bodily extension there is also the risk of amputation (1964:67). For example, the mobile phone extends the voice, but can result in the amputation of writing skills, which would have been necessary in the case where telecommunications did not exist. He warns that it would be at our own peril if we choose to ignore the amputations and only celebrate the extensions.

This notion of ignoring the amputations reminds me of forgetting older technologies. These technologies were regarded as extensions at some point, but were in turn developed and extended and upgraded into something better. We forget to celebrate these technologies that are often platforms that allowed for the development of newer technologies.

The phonebook has largely become futile in the face of modern information directories. Nowadays the phonebook can also be regarded as having been amputated. The patience it took to page through and find a contact number or sometimes having to call a few people with the same surname and initials before finding the person you are looking for, is being replaced by the ability to find the correct number online or in a contact list on a cell phone much more quickly. These devices and tools become new extensions of the abilities of our bodies and minds.

As in the example of the wider frame that allowed factories to replace the work of the craftsmen who became known as the Luddites (and where the product made on the frame was not of better quality), these contemporary developments/extensions are not always qualitative improvements, but often occur with the aim of making things faster, simpler, more economical and *seemingly* better. Perhaps we increase functionality and speed to allow ourselves more leisure time, yet it can happen that somehow we manage to fill up the intended leisure time with the need to ‘improve’ things to become even faster and even simpler. Inevitably one always has the

feeling of being on the back foot trying to catch up. Hence it is important to consider the risk of amputation alongside the opportunity of extension.

4.5 The Weaving Loom as Extension

I would like to present the weaving loom as an example of a bodily extension that enables the weaver to do more than what can be done without the loom. In *The Book of Looms* (1979) Eric Broudy writes that the term 'loom' is derived from the Old English word 'geloma' that was used to describe a 'tool' or 'utensil' (1979:7). The weaving loom, like a spear or stone axe, was a tool used as a means to an end (Broudy, 1979:7). Broudy explains that the looms often disappeared in the shadows of the masterpieces created on them and as such, looms were neglected in historical accounts of weaving (1979:7). In this section I refer to a selection of weaving looms to support my discussion on the relationship between weaving technology and digital technology, and the relationship between the weaving loom and the body.

In order to contextualise the weaving loom within the scope of this paper, it may be beneficial to consider the relationship between the older technology of weaving and present-day information technology. Amelia Groom provides an interesting parallel to weaving when remarking on the influence of cultural movements on one another and the teleological schemas that dominate Western art history (2013:14). Weaving can be seen as a metaphor for information technology and information-sharing systems like the internet with seemingly infinite threads of communication and information travelling back and forth, a "criss-crossing" movement of "parallels without direct imitative interaction [challenging] teleological temporal schemas" (2013:14). Our teleological ideas of the forward flow of time, interactions and the order of events are challenged through the spider web-like movement and construction/design of information in our

age, where simultaneity is the order of the day. Digital technology today plays the same role as a tool for a criss-crossing movement in culture as the weaving loom plays in weaving.

Apart from the metaphorical relationship between weaving and information and digital technology, weaving and specifically the weaving loom also had a very direct and literal influence on computer technology and digital thinking. As early as 1725 the French textile worker Basile Bouchon[59] developed a system whereby the weaving loom could be controlled by a paper tape perforated according to a specific pattern. Bouchon's method entailed using a set of hooks on the weaving loom that would raise the warp threads according to the punched pattern on the paper (Plant, 1995:51). This was a significant improvement on controlling each warp thread separately in the drawloom with the manual aid of a drawboy (Davis & Davis, 2005:79).

This system came to be known as the punch-card system, as Bouchon's assistant Jean-Baptiste Falcon later improved the design to work with strips of punched cards rather than a roll of paper (Kaur *et al.*, 2014:36). Jacques Vaucanson, a French engineer and inventor, continued to develop this type of weaving and attempted to construct the first automated loom (Suisman, 2010:19). However, Vaucanson's loom entailed laborious processes necessary for the creation of open-ended (not strictly repetitive) textile designs and as such was not particularly successful.

[59] Basile Bouchon was the son of a weaver and organ maker (Suisman, 2010:19). It is probable that Bouchon's knowledge of organ making led him to develop the punch-card system. Rotating pegged cylinders are used in automated organs and to make these peg cylinders the design of where the pegs would be placed first had to be laid out on paper before transferred onto the cylinder. In this process, the paper would be perforated according to the design for the cylinder. The paper would be wrapped around the cylinder and the holes in the paper would indicate where the holes in the cylinder were to be drilled.

Joseph-Marie Charles (also known as Joseph-Marie Jacquard by his father's nickname) was the one to finally construct an automated loom in the early 1800s (Suisman, 2010:19).

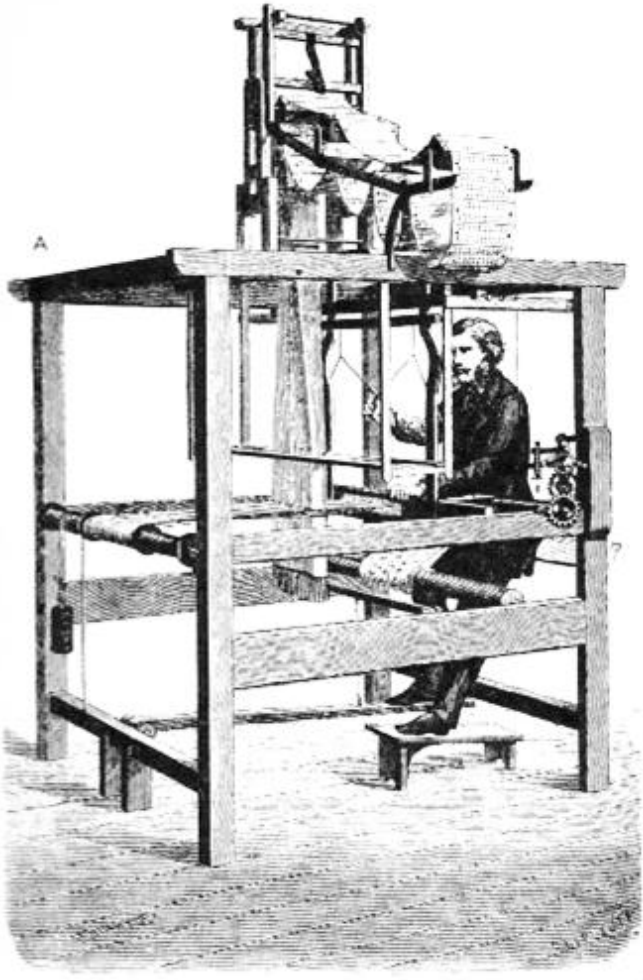


Fig. 25. The Jacquard loom. (Ptak, n.d.).

The essay *The Future Looms: Weaving Women and Cybernetics* (1995) by Sadie Plant explains the development of Joseph Marie Jacquard's punch-card system in weaving and emphasises that the Jacquard loom was the first machine to store information (according to binary logic)[60] – a function of cardinal importance in the development of computer technology (51). The punch-card system was a massive advance on the hand-weaving techniques used in earlier days. The system was invented in 1804 and opened up many doors to improve the mechanised function of weaving. Fernand Braudel writes in *Civilization and Capitalism, 15th-18th Century: The Structure of Everyday Life* (1982) that "[t]he most complex human engine of all was the loom, which reduced everything to simple actions" (337). The complexity of the machine increased the ease with which it was used.

The 'Jacquard Loom' [Fig. 25] was a hit in France and soon other countries also started to use this new technology (Davis & Davis, 2005:79). It came to play a significant role in the automation of cloth production, particularly because of its ability to produce more in less time. Jacquard's loom is also sometimes referred to as the Jacquard head, because it is more accurately described as an apparatus that can be attached to different looms (Davis & Davis, 2005:79).

Today, weaving looms have become fully automated and digitised in the sense that the woven patterns can be constructed digitally and the loom in turn operates digitally according to these patterns. The options for "weave

[60] The punch-card system is an early form of binary coding using the numbers 1 and 0 to refer to data, because of the process of joining two sets of thread called the warp and the weft. Binjie Xin *et al*. write that "every weave reveals a two-dimensional arrangement of warp and weft intersections, which can be represented mathematically by a binary matrix: 1- stands for warp on weft; 0 - stands for weft on warp and vice-versa" (2011:33).

code technology, which could be defined as coding technology based on the binary structure of the woven structure" are vast, and weaving technology has the potential to "make codes wearable, flexible and fashionable" (Xin *et al.*, 2011:33).

The link between weaving technology and coding technology is so strong that it is difficult to overlook the historical connection between weaving and computer technology. As mentioned earlier, the punch-card system played a significant role in computer development. It was first used in informatics in 1832 by Semen Korsakov and later in 1837 by Charles Babbage – who is known by some as the "father of the computer" for the creation of the analytical engine[61] (a machine programmed by punch cards) [Fig. 26] (Halacy, 1970).

The hand loom, on the other hand, is operated manually. This type of loom stands in contrast to the mechanised machine looms that were of particular importance during industrialisation. Although in contrast to power looms, a hand loom cannot be regarded as inferior to the more complex automated/power loom structures. In fact acclaimed textile artist, Anni Albers writes that

> "[a]ny weaving, even the most elaborate, can be done, given time, with the minimum of equipment. The main incentive, therefore, for perfecting the weaving implements has always been that of saving time" (1965:22).

[61] Due to Bouchon's death he never finished building the machine himself. A program for the Analytical Engine was eventually developed by Augusta Ada King (countess of Lovelace) and this program came to be recognised as the first computer program ever made (Lovrenčić *et al*., 2009:80).

Fig. 26. Charles Babbage's analytical engine processor. (Johansen, 2013).

The development of weaving looms into intricate and complex machines was largely driven by the necessity to facilitate work and increase speed for the sake of production (Hecht, 2001:9). The weaving loom was (and remains) a particularly useful tool in cloth production and like many other machines its development was acutely influenced by industrialisation and an ever-growing consumer culture. The complexity of the weaving machine paradoxically does not mean increased complexity in the process of weaving. Instead, as mentioned earlier, improvements on the machine aided ease of use and led to a decrease in operational effort (Hecht, 2001:9).

Today the hand loom is “no longer of consequence as a manufacturing method in an industrial age”; it is rather used to create fabrics for decorative use or as a tool for art-making purposes (Albers, 1965:21). Furthermore, weaving is an ancient craft that, despite its mechanisation through the development of complex machinery, “remains essentially unchanged to this day” (Albers, 1965:19).

One of the most important and fundamental aspects of weaving is that the warp must be given tension and over the centuries this aspect of weaving greatly determined the loom structure used for weaving. Not everyone agrees on what a loom is (Broudy, 1979:14). Some argue that a mechanical shedding device[62] must be present for the weaving structure to be considered a loom; for this thesis a loom is defined as “any frame or contrivance for holding warp threads parallel to permit the interlacing of the

[62] A shedding device is used to separate the upper warp yarn from the lower warp yarn according to the relevant weaving structure. In a plain weave structure every second warp yarn is lifted in order to simplify the process of inserting the weft yarn [Fig. 4]. The separation is called the shed and the act of separation the warp yarn is called shedding (Albers 1965: 24). A rigid heddle reed is one example of a shedding device [Fig. 3, 4, 42].

weft at right angles to form a web" (Broudy, 1979:14). In this definition of a loom the human body has been used in multiple ways to aid in achieving the objective of weaving.

Using the Ojibway bag loom [Fig. 27], the warp was simply draped vertically and the weft was inserted laterally (Broudy, 1979:14-15). For this weaving structure the body would have been standing upright and moving from left to right, perhaps with the presence of a second body in larger structures.

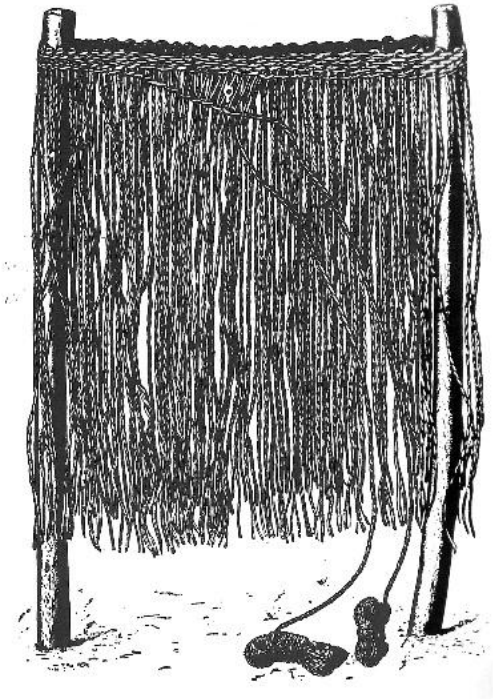


Fig. 27. Ojibway bag loom. (Broudy, 1979:15).

The necessity of tension heavily influenced the design of certain weaving looms. The warp-weight loom [Fig. 28], generally credited to Neolithic weavers in Europe, is a structure with a simple solution to the problem of tension (Broudy, 1979:14). This type of loom stands upright and tension is added by attaching one end of the warp threads to an elevated horizontal bar and the other end to a weight. Weaving on a warp-weight loom would have required a sitting or standing body moving from left to right in the case of a larger tapestry.

Fig. 28. Warp-weighted loom on a Greek vase (or lecythus), c. 560 B.C. (Francisco, 2016).

Some of the earliest examples of weaving indicate simply placing the warp on the floor and interweaving the weft by hand, perhaps with weights like rocks holding the warp in place (Broudy, 1979:14). The horizontal ground loom [Fig. 29] solved the tension problem by attaching both ends of the warp to a rod that is pegged into the ground. As depicted in one of the earliest representations of a loom, this structure would have required a seated or bent figure, kneeling over to perform the act of weaving.

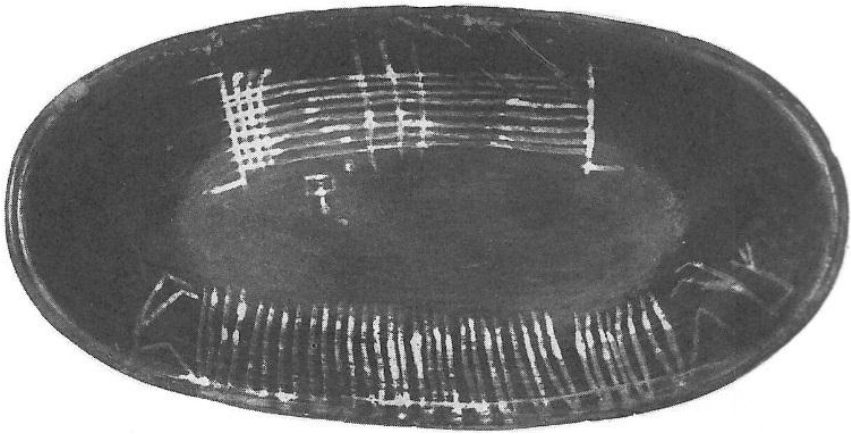


Fig. 29. Early depiction of a horizontal ground loom on a Badarian bowl, c. 5000 B.C. (Broudy, 1979:15).

Similarly, in the case of the ancient Egyptian mat loom [Fig. 30], the figure is represented sitting on the woven part of the mat physically engaging with the process of weaving (Broudy, 1979:15).

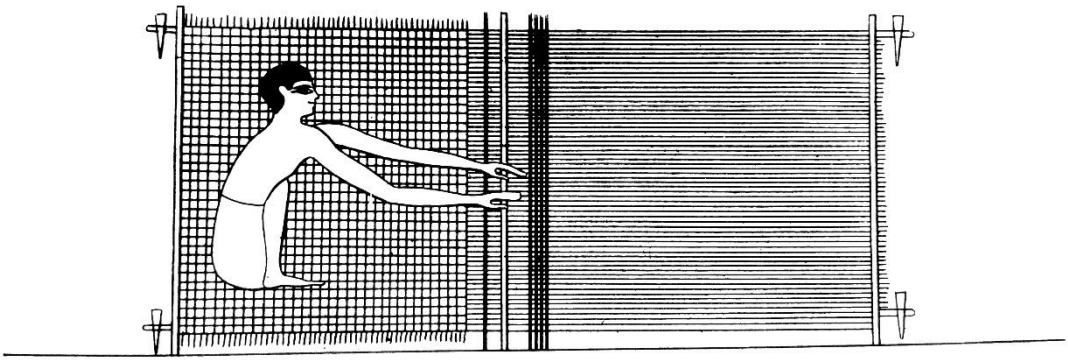


Fig. 30. Egyptian mat loom as represented in the Khety tomb at Beni Hasan, c 2000.B.C. (Broudy, 1979:17).

Backstrap looms [Fig. 31] are particularly suitable for demonstrating the role of the body in the weaving process. This loom enabled regulative tension in the weaving process. In this device, one end of the warp threads is attached to a bar that is in turn fixed to a tree or pole (Albers, 1965:23). The other end of the warp threads is tied to the waist of the weaver like a belt. By leaning forward or backward the weaver can adjust the tension of the warp (Albers, 1965:23). In this instance, the body is not only significant in its function as weaver, but it is additionally a vital component of the loom itself.

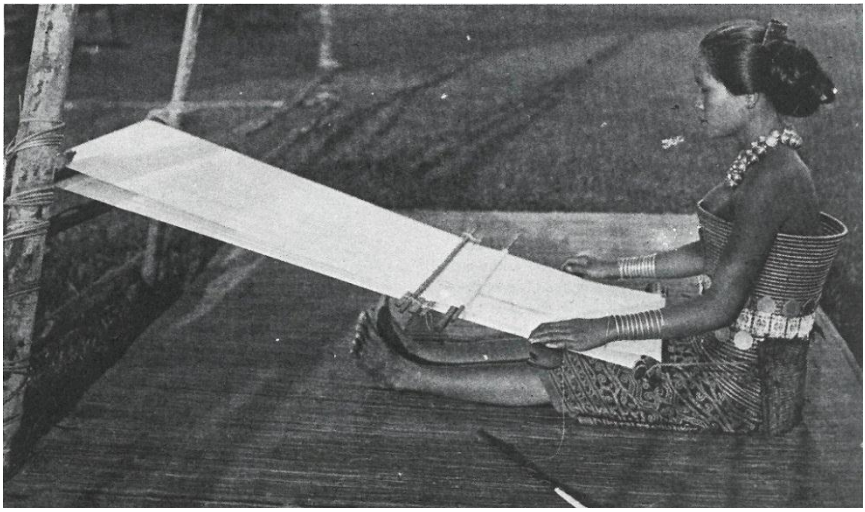
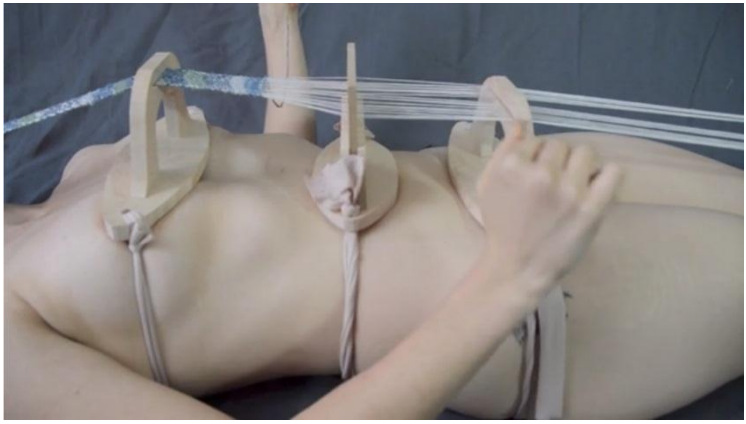


Fig. 31. Two-bar backstrap loom. (Broudy, 1979:94).

The artist Kailey Bryan explores the corporeality of the weaving loom by presenting her own body as part of the loom in her artwork *Body Loom, 5'44"* (2015) [Fig. 32-35]; a performance piece where the artist lies on her back imitating a horizontal ground loom. The one end of the warp threads is held tight between her toes, while the other end is gripped by the artist's lips. The warp is passed through a free standing rigid heddle placed on the artist's abdomen. The rigid heddle comes to life and functions by means of the artist's breathing as the artist's abdomen is raised and lowered to result in the shedding of the warp.

According to Bryan, the artwork is a construction of her body into a type of living machine that integrates internal and external processes of both the living body (internally and externally) and the living machine (externally, but animated through both internal and external bodily functions) (2017).

As the viewer of the artwork, I became aware of the intensity of this weaving process. The tension created in the warp is due to tension in the lips and toes. To maintain this posture seems strenuous and artificial. Conversely, the blind navigation of the hands speaks of a familiarity with the structure built on the body, almost growing out of the body as hybrid body parts. The weaving hands tell of a careful, but comfortable (and confident) action, almost like plaiting one's hair. When operating this (external) machine, metaphorically growing from the body, there is an interplay between internal and external, but also between cognitive and physical, or concentration (almost meditation) and automatic physical activity (Bryan, 2017).



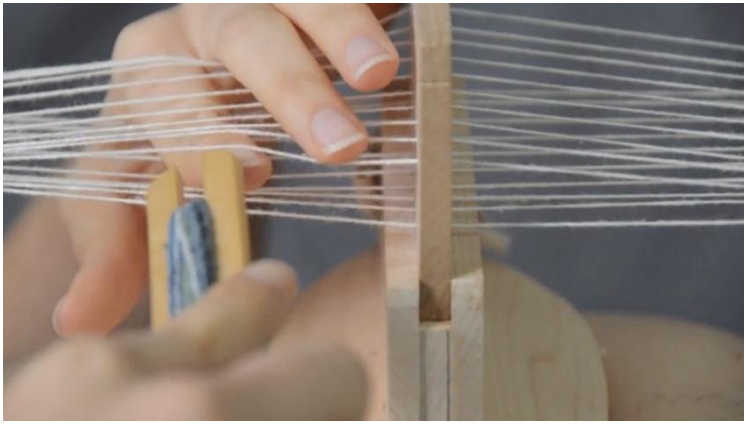


Fig. 32-33. Kailey Bryan. 2015. *Body Loom, 5'4"*. Performance. (Bryan, 2015).

Fig. 34-35. Kailey Bryan. 2015. *Body Loom, 5'4"*. Performance. (Bryan, 2015).

Adele Stafford is an artist based in Hillsborough, North Carolina. She writes the following of her hand-weaving process on a mechanical dobby loom:

> "There is sound and sway, all of it in harmony as the machine and the body come close to resembling one [another] in the way that a cellist and her cello share one body while in song" (Stafford, 2016).

Stafford's physical body (like my own) does not form part of the structure of her weaving loom as in the case of Kailey Bryan's performance. But, even in sitting in front of the loom, touching the thread, treading the treadles and moving her arms, she orchestrates an extension and retention rhythm through which she experiences a unification with the machine towering in front of her and over her.

For the hand weaver, weaving is a method that "insists on physical interaction at different times during the making process" (Harvey-Brown, 2014). Hand weaving implies a bodily encounter with the materials used. At different points in the process of setting up the loom (perhaps unpacking a newly bought loom/unfolding a travel-sized table loom) or warping the loom (measuring the thread, tying it to the structure that will regulate its tension) or interlacing the warp with the weft in the process of weaving, the weaver's hands connect with the apparatus. Not tied to the machine, rather operating the machine, the hands are not overtly submissive to the machine. Yet, the hand loom cannot function without the hands and if a desired process or product is to be undertaken or achieved, then the hands must do as the machine requires. Kailey Bryan's *Body Loom, 5'44"* illustrates that it is not always clear if the human body is in control of the loom or vice versa.

To conclude, I do not suggest that weavers always consider their tools as extensions of their bodies, but in some instances, I do contend that it could be seen that way. I certainly feel as though my loom extends my bodily capabilities in terms of the task of weaving (and as such, the task of taking time). Through the ideas of Ernest Becker and Marshall McLuhan I present my body-loom combination as a machine-body, structured to facilitate the act of weaving and the act of timing and taking time.

Artists have long been experimenting with artificial extensions or prosthetics to enhance their artistic capabilities or experiment with and challenge these capabilities. One such example is the artwork *Finger Gloves* (1972) by German artist Rebecca Horn, an artist who experiments with body sculptures and body modifications [Fig.36]. This artwork consists of two pairs of five-meter-long 'fingers' made of wood and fabric and attached to the artist's wrists to be controlled by her own fingers. The artwork forms part of a series of bodily extension pieces in Horn's repertoire. While the artworks in this series "seem like tools for improving human capability, the resulting effects are often debilitating or grotesque, serving only to draw attention to the limitations of the wearer's body" (Watling, 2012).

In this artwork and other similar pieces, the amputation that is caused by the extension is emphasised through the dysfunction of the added body part. The extension, as such, becomes a limitation or constraint rather than a liberating and enhancing tool. When weaving, the weaver's hands are constantly in touch with the weaving tools. The artist's hands and body are limited without the weaving loom and as such the weaving loom, the tool, could be seen as an artificial extension of the weaver's body. This extension is one that can be used intermittently as required. Therefore, it is different from other constraining forms that artists may engage with as

extensions or restrictions of hands, bodies and creativity. In the act of weaving my body is also an extension of the weaving loom, a corporeal 'prosthesis' that animates the loom at rest.

Fig. 36. Rebecca Horn. 1972. *Finger Gloves*. Performance. (Horn, 2009).

CHAPTER FIVE: SELF, PROCESS, BY-PRODUCT

In order to discuss the role of my (machine) body in my practice, I would like to give some background to the creation of my loom, and to critically contextualise my own body as female, white, middle-class and South African. In this chapter I present the aims and objectives for creating my own loom, particularly as used in the performance artwork *In Time* (2017) and provide some final insights into my art practice and the reasoning behind it. Furthermore, I include a discussion of time-based work in comparison to results-based work, specifically with regards to the existence and relevance of the made object. As a performance artwork, I look at the redundancy of making nothing tangible and nothing long-lasting and position the act of making 'nothing' as a political act rather than as something futile.

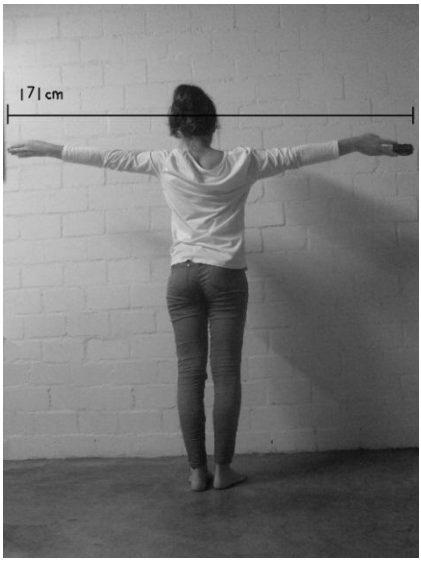


Fig. 37-38. Marguerite Roux. 2017. *Measuring my body I & II*. Digital Photograph and Sketch. Dimensions Variable.

The weaving loom I created for the artwork titled *In Time* is made in direct relation to my own body dimensions [Fig. 37-38]. For example, the reach of my arm's span determined the width of the frame. The length of my hand relates to the size of the rigid heddle reed and the height of my hip influenced the height of my loom stand. The loom can be seen as a mechanical extension of my body. It is crafted to overcome my physical limitations. In turn, my body can also be seen as an extension of the weaving loom: a corporeal form that animates the unmoving machine. Ultimately, I present my loom and body combination as a machine-body.

The loom is made to accommodate the weaving process, but my weaving is not a process with a product in mind; instead it is a process in itself; of engaging with time that passes. Every weft I pick is a length of time, not according to the time of the clock, but according to another, more abstract, fictional sense of (work) time (Willis, 1999:248). Through the act of weaving I also engage with the act of taking time, for the sake of taking time; of counting time, of suspending preconceived notions of time, and possibly also as a simultaneous act of rebellion against, and salutation to, the ticking clock. Time can be experienced subjectively. In my work I investigate weaving as a process of measuring time by means of a machine-body.

The hand built aspect of the weaving loom and its actual construction [Fig. 39-45] also highlights the relationship between tool or machine and body. The wood used to create this machine is mostly from a cypress tree from my parents' garden, cut down a few years ago to make room for another tree.[63] I can vividly recall climbing on the wall closest to the cypress tree as a child, crawling under the branches of the tree growing next to it, and

[63] I only really took notice of the new tree after I had used the wood of the previous tree.

eating the latter's somewhat bitter berries. My memory, however, has become blurred, but also amplified and reconstructed by stories, images and photographs. Nevertheless, I can reimagine the texture and smell of the cypress leaves almost as distinctly as I can reimagine the tree next to it. The rough, spiky surface of the raw wood, bark and leaves now stand in contrast to the soft skin-like texture of the loom. When the cypress tree was cut down, the wood was sliced in lengths and stacked in my father's garage, it stayed there for some time, well protected from the weather, but unused and without purpose.

When I cut these raw slabs of wood without proper tools for planing the edges or ensuring that the bark was removed with a straight cut, it involved a very hands-on, intuitive process. I feel that the history of the object in terms of its existence as a tree and the process of its metamorphosis into the loom strengthens its metaphorical connection to my 'self' and my body.

The other pieces of wood I used were leftovers from previous projects or off-cuts that could not easily be used for anything on their own. Most of the material was largely purposeless before being incorporated into this functional object. The heddles on the rigid heddle reed are the only parts that were made almost exclusively by machine (apart from the design and operation of the cutting machine). For me, the combination of hand and machine-made elements is an interesting iteration of the ideas around production dealt with in this thesis.

The production of the loom further highlights my experience and awareness of time through the temporal nature of the pieces and parts used for the loom. For example, the life of the tree is a metaphorical length of time and so is the life (or length) of my memory of the tree that signifies another length of time. These are abstract types of times, not measured by the clock, but rather, through rings in wood or pictures in my mind. The

nature of memory certainly is not stable.[64] The experience of time passing at a slower or faster pace is emphasised in memory. Events appear to have passed by either even more slowly or even faster. This more lyrical or fluid understanding of memory and the life of the tree is situated in an interesting (and contrasting or even complementary) position towards the rational and controlled clock time; something highlighted by the strict timeframe and limitations within which I made the loom.

When I started using the tool (i.e. the loom) for its intended purpose, more aspects of the body-machine interface came to the fore. The physical pain of the corporeal body makes for an anticipated, yet uncomfortable, relationship between myself and the machine. Pain does not only affect my living body, but also the machine that is expected to operate by way of that body. In the process of weaving, the body is often found in an unhealthy position of leaning forward or with arms lifted for lengthy durations. Bad posture, bad light, fatigue and several other elements can lead to the experience of pain. With the growing awareness of discomfort in the body, I feel alienated from my lifeless counterpart and am faced with the option of either pressing on or taking a break, something that reminds me of the discomfort between humans and machines with specific reference to the clock.[65]

---

[64] Cultural critic Andreas Huyssen has written extensively on the notion of memory as slippery and uncertain and perhaps also as a way to slow down in order to come to terms with past events. For more information refer to his book *Present Pasts* (2003) and a collection of his essays published in *Twilight Memories: Marking Time in the Culture of Amnesia* (2012).

[65] Having the option to take a break emphasises the divide between my labour and actual factory labour.

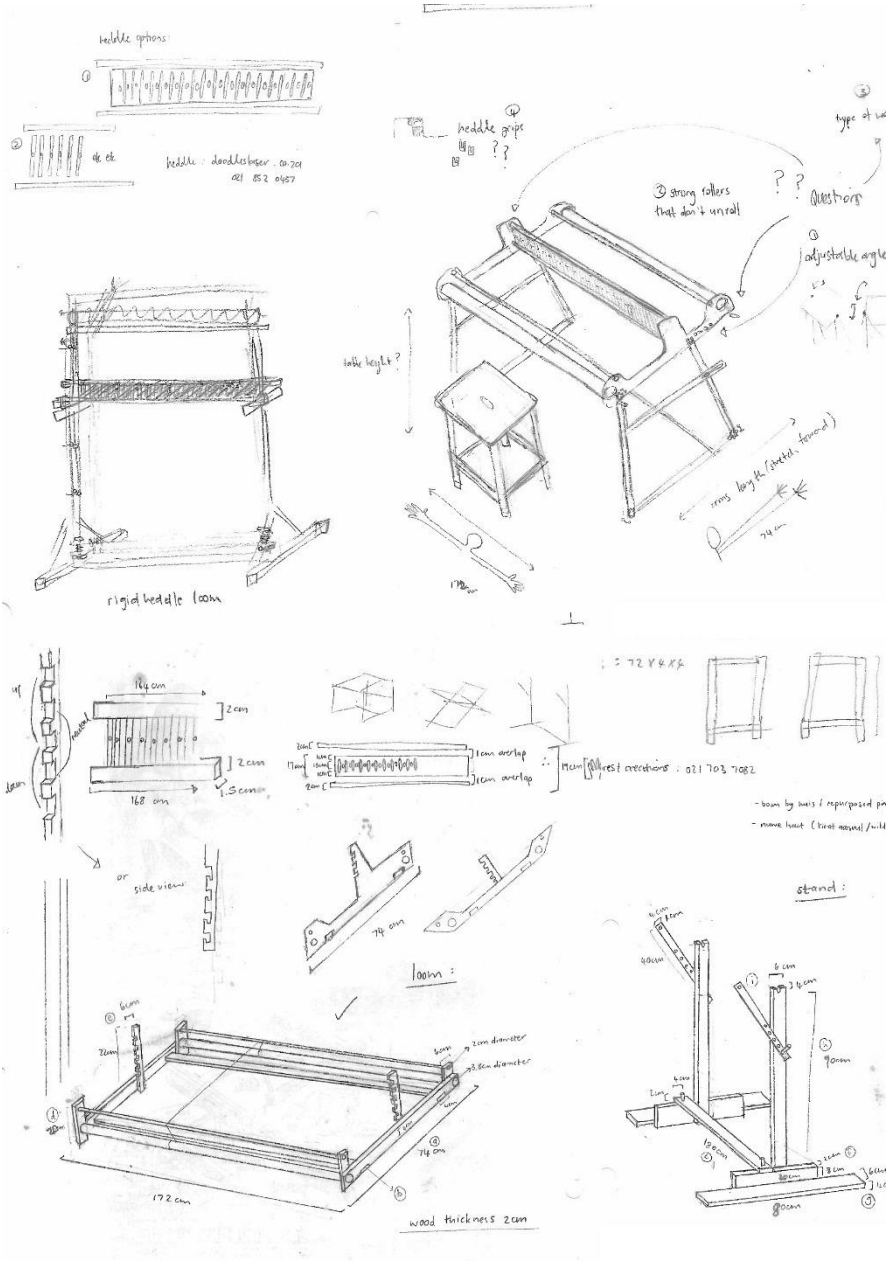


Fig. 39. Preliminary sketches in preparation for the construction of my loom. 2017.

Fig. 40. Masking tape and skewer loom maquette. 2017

Fig. 41. In the process of making my loom. 2017.
Fig. 42. Section of my rigid heddle reed. 2017.

Fig. 43. In the process of making my loom. 2017.
Fig. 44. Completed loom in woodwork studio. 2017.

Fig. 45. Close-up of my loom showing the heddle in up position, creating a shed. 2017.

5.1 My Body in Context

In the performance *In Time* I place my body, a female body, in a position where I contemplate industry and production alongside the notion of time. The rise of industrial capitalism enforced the separation of gender roles in domestic and public spaces. Women were (and sometimes still are) perceived to be "docile, easily manipulated and willing to do boring, repetitive assembly work" (Fuentes & Ehrenreich, 1983:12), making them ideal candidates for factory labour. The factory space became dominated by men, while women (and children) were forced into subordinate positions of lower-paid and 'less important' labour (Fuentes & Ehrenreich, 1983:12). By repetitively performing the act of weaving I also repetitively perform my gender identity. I am conscious that weaving in some cultural contexts has been regarded as women's work. Through my weaving I am asserting my femininity, not as an imitation of gender conventions, but as Lucy Lippard explains, as an unapologetic affirmation of my position in a visual arts environment (1976:57) and in a masculinised industrial environment.

By placing my feminine machine-body in what has arguably been considered an inherently masculine space, I hope to subvert the dominance of industrial masculinity through the act of making something redundant instead of something useful and functional (as would be expected in an industrial environment). I do not abide by the factory laws of time; instead I tap into my own experience of time. My objective is simply the act of taking time. The act of metaphorically picking myself up and placing myself in a masculinised space where I am cognisant of gender expectations is a somewhat uncomfortable necessity that comes with my chosen material and method of taking time. It is similar to the discomfort of my body in relation to the loom when weaving for hours on end.

In this research project I do not overtly focus on class divisions and the current South African socio-political conversations around production. This is certainly an opportunity for further research, but at this point I do wish to mention the complexity of the production process. I am critical of my own position as a white, middle-class South African female with certain privileges and opportunities that allow me to engage with art production and research. There is a sense of luxury in having the opportunity to create art, especially when the process of creation is largely futile and concerned with the act of taking time.

I am in an advantaged position with the opportunity of placing myself in a situation where my body and my machine become integrated, as a type of introspective experiment. Most commonly this is not the case when human bodies become machine-bodies; opportunity and options cannot be assumed and the disproportionate distribution of wealth in our societies today strongly determines the position of individuals working with machines (Bryan, 2017).

There is also an immense difference between industrial machine-bodies and artificial-intelligence machine bodies[66], where the wealth disparity may leave the small/slow fish behind if/when we reach a point where Artificial Intelligence becomes a necessity for human survival. As mentioned earlier, “we are moving from a world in which the big eat the small to one in which the fast eat the slow”, yet in this world big and fast and rich are often synonymous (Schwab in Honoré, 2004:3). I find myself in an in-between space where I am neither first in line to become an AI machine-

[66] With the difference between industrial machine-bodies and artificial-intelligence machine-bodies I mean to refer respectively to the possible machine-body of a factory labourer in contrast to the possible machine-body of an individual who has (or is first in line to gain) access to the (seeming) advantages of Artificial Intelligence technology.

body nor truly operating as factory labourer. My machine-body is positioned perhaps as a mediator or commentator, where I can look at my own position introspectively, but also question the situations to my left and my right.

5.2 Process versus Product

Having established my own body as a machine-body occupied with the act of taking time I further need to deliberate on, and unpack the notion of my art practice as a time-based process rather than a results-based one. In my discussion of these processes I refer to the work of Marina Abramović and Ulay (Frank Uwe Laysiepen) and investigate the difference between time-based processes and time-based artworks. I consider the by-product of the act of making (be it time-based or results-based), specifically deliberating on the life of the object after production. To aid in my analysis of the by-product, I refer to the work and writing of Christine Cronjé. Performance art is mentioned in my consideration of the concept behind work that is deliberately made to decay. Finally, against this backdrop I discuss my own process of weaving as a time-based process.

According to the Cambridge English Dictionary, the concept ‘time-based’ is an adjective that can be “used to describe payment that is related to the time you spend working, rather than the number of things you do, produce, etc” (2017). ‘Time-based’ can be seen in comparison to or in contrast with ‘results-based’, where the latter can be “used to describe payment that is related to the number of things you do, produce, sell, etc.” (2017), for example, in the context of time-based or results-based incentives.

To apply these definitions to art practices, a time-based process refers to work where the time spent on the process of making is recognised as more important than the result of the creative process. Conversely, (to

differentiate between time-based processes and time-based artworks), time-based art commonly has a determined beginning and end point, where duration is the dimension of the artwork. A time-based *artwork* is not necessarily created by means of a time-based *process*.

Time-based artworks often take the form of time-based media where the artwork is predominantly categorised by digital media[67]. However, time-based art does not always have to use digital media as medium as it could also take the form of an art 'happening', performance artwork or work that uses "the passage of and the manipulation of time as the essential element" as explained by artist/researcher Onajide Shabaka (2012).

It is this last definition of time-based work by Shabaka that reminds me of the performance by Marina Abramović entitled *House with the Ocean View* [Fig. 46]. In this artwork the duration of the performance forms part of the dimensions of the artwork and the manipulation of time is key in the experience of the artwork.

This time-based artwork was presented in the Sean Kelly Gallery in New York where Abramović lived for twelve consecutive days in 2002. The space she lived in consisted of three open platforms raised from the floor. She had no privacy and no way to escape, as the platforms were connected to the floor only by ladders with butcher knives as rungs. Time is an important element in the creation of the work, especially when considering that the process is not aimed at creating a tangible product or work of art. In *House with the Ocean View* an alteration of time could be felt when perceiving the other-worldly living conditions and the artist's act of living. Abramović's own perception of time is removed from the worldly

[67] Time-based media includes the use of computer technology or media like film, sound and slides.

time outside her living quarters. A metronome ticking at intervals further apart than seconds aids in the perception of time passing at a slower rate. She wanted her presence in the gallery to change the "molecules of the air and change the […] feeling of time in the space, so that anybody from the public can come there and feel the same, and just forget about the time" (Abramović in MAI, 2002).

Fig. 46. Marina Abramović. 2002. *House with the Ocean View.* Performance. (Birzaka-Priekule, 2017).

The aforementioned artwork is similar to a piece by Abramović and Ulay entitled *Relation in Time*[68] (1977) [Fig. 47] or another work by Abramović called *512 Hours* (2014). In each of these performances the viewer, who becomes a participant in the performance, experiences an alteration or perhaps an illusion/distortion of time; a suspension of 'real', clock time. Performance artworks are often experiential activities or political activities, where the action is loaded with depth and meaning without actually creating a physical, tangible and long-lasting artwork.

Fig. 47. Marina Abramović & Ulay. 1977. *Relation in Time.* Performance. (Smirna, 2017).

[68] The performance *Relation in Time* (1977) saw the artists Marina Abramović and Ulay sitting back to back with their hair tied together for seventeen hours (the first sixteen hours without an audience). This performance was presented at Gallery Studio G7 in Bologna, Italy.

The artwork *512 Hours* was a performance that took place over sixty-four days for eight hours a day at the Serpentine Gallery in London. Abramović and her assistants moved around in the space and the audience was invited to join them, but any possession like bags and cellphones had to be left behind before entering the gallery space. Abramović directed the visitors/viewers/performers to engage in certain activities like staring at a primary colour block on the walk or walking in slow motion. One such activity was that of counting and sorting rice and lentils.

Fig. 48. Visitors counting and sorting rice and lentils during the exhibition *Marina Abramović: In Residence*, presented as part of the Kaldor Public Art Projects in Sydney, 2015. (Young, 2015).

This exercise was later also presented at the Marina Abramović Institute (MAI) in New York and at exhibitions like *Marina Abramović: In Residence* (2015) in Sydney [Fig. 48]. Billy Zhao (working in MAI Special Projects) and Paula Garcia (an MAI collaborator) explain that the activity is not really about how many lentils and rice kernels you count, it is also not about the method of counting and separating (each acting individual gets to choose his/her own method); what this activity is really about is simply doing the task at hand (2014).

We as humans might find it difficult to focus on only one thing, to do one thing at a time, and this exercise is structured so that we can allow ourselves simply to be there, counting – an exercise in pure presence (Garcia in MAI, 2014). During the process different emotions of eagerness, frustration and anger may be experienced, but hopefully the person doing the counting will reach a point where they experience calmness. One of the core philosophies of this exercise is to slow down and become introspective and aware of oneself (Zhao in MAI, 2014).

In a way, my weaving process is a similar activity, involving counting the number of weft strands I weave. The act of counting shifts my focus away from external inputs and draws me into the act of weaving. The counting and the weaving can sometimes be challenging and tedious, but the emotions and thoughts develop and progressively move towards a point of calm. My weaving is perhaps also an exercise in focusing on one thing and doing only the task at hand.

These examples of artworks are most clearly defined as time-based works. However, they are also products of results-based processes, as the performance itself (i.e. the artwork) is a result of preparation work done by the artist. The result of the process of preparation and creation may not be long-lasting and tangible, yet there is still a result. If we consider the

adjective ‘results-based’ to describe the process by which the artworks were made, we can argue that these pieces are results-based in the sense that the result takes a dominant role over the process. But, if we use the adjective ‘results-based’ alone to refer to the artwork itself, this is problematic, because arguably the duration of the artwork/performance itself is more important at times than the outcome even if the outcome is important for its impact on the participant. I would suggest that we use the term ‘time-based’ to describe the artwork rather than the process of preparation, in order to argue that the examples mentioned above are time-based artworks. In other words, I mean to say that the artwork itself is concerned with the experience of (either or both) the artist and the viewer within a given length of time. The duration of the artwork and what happens within that duration is the primary focus rather than the outcome of this experience (even if the result is also a determining factor in the creation of the artwork). The adjectives ‘time-based’ and ‘results-based’ can be applied to different actions in art practice and the meanings of these terms can also differ slightly.

My performance *In Time* [Fig. 49-54, 56, 57] could be described as a time-based artwork, that emphasises the duration of the performance and the experience of time as most important. Granted that this performance artwork is the product of a results-based process, most of my work employ a time-based process where the product of the act of making is not of primary concern. The performance *In Time* is a showcase of my time-based process, even if it in itself is the outcome of a results-based process of preparation.

Although I have said that the result of a performance artwork takes second priority in comparison to the activity of the performance itself, it is important

at this point to interrogate more deeply the result of a performance or time-based artwork.

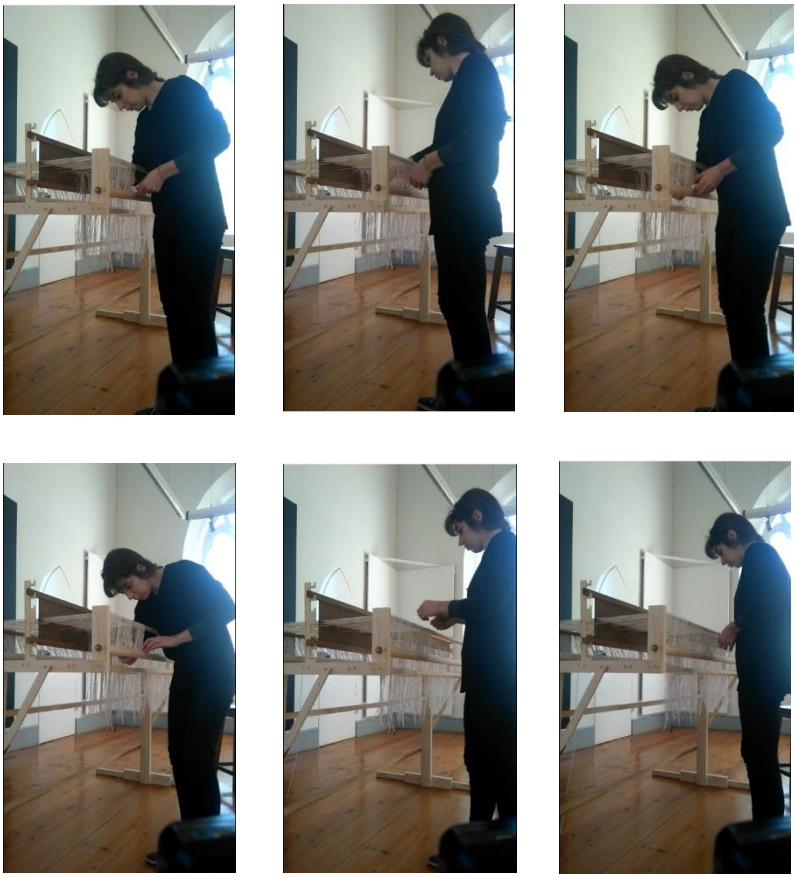


Fig. 49-54. Marguerite Roux. 2017. *In Time.* Performance.

The result may not be central to the art practice, yet it is conceivable that the artist intended that the viewer remember something about the experience, to reflect on this at a later stage. Even if this was not the intention, it is very likely that the experience will nevertheless be thought of and remembered. This is part of the by-product of the performance, as is any physical material used or documentation of the performance. These by-products cannot be disregarded.

Not only do I consider the result of the performance artwork, but I also ponder the result or outcome of time-based processes and time-based artworks. If I look specifically at my own work, I argue that my focus is on the process of weaving and the act of taking time. One of the results, however, of my engagement with weaving is a woven material that exists as a by-product of my creative activity. It is an object that tells of the process that took place in order for it to be created. The making, the weaving, the taking time and the materiality of my making process is the dominant focus in my practice, yet “the made objects are inevitably what endures of the process and what comes to be presented as artefacts” (Cronjé, 2014:34).

Christine Cronjé creates objects with cigarette ash as her main medium. She mixes the ash with water to form a clay-like substance that dries out to become a sculptural object. Yet the more the ash dries, the weaker the bond of the water becomes and inevitably the object disintegrates and returns to its previous state as ash. Her primary concern is not the durability of the object or even the object itself, but rather the act of making.

When I weave and I present the woven object to the viewer, what is seen is an object “removed from the act of making”, an artefact that signifies the process of making or acts as witness to the act of making (Cronjé, 2014:34). The made object gives insight into the process of making and

helps the viewer understand the process of creation (Scarry, 1985:314). Cronjé writes that the made object references the process by which it was made and perhaps also its maker, but there is a "breaching point" referred to as the "moment when the threshold between the act of making and the made object is permeated" and the object could potentially take on a life of its own (Cronjé, 2014:36).

Cronjé writes about her *Counter-body* series [Fig. 55] made in 2013 as objects that speak of their creator's presence. The artist created the objects in this series by pressing (ash) clay against the natural hollows of her body, for example, in her fist or collarbone (Cronjé, 2014:38).

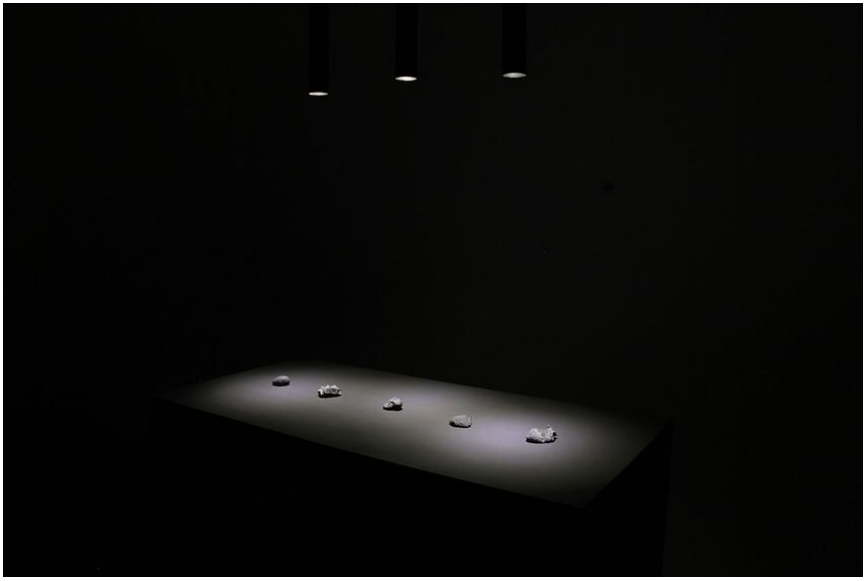


Fig. 55. Christine Cronjé. 2015. *Counter-body* (series). Cigarette Ash Objects. Dimensions Variable. (Wilson, 2015).

By clenching her fist around a piece of clay, the shape and lines of the artist's hand are imprinted on the clay and form an almost anthropomorphic object. The object, a counterpart to the artist's body, reflects both the hand of the artist and the artist's absence. As the piece is left to dry, the shape of the artist's hand is solidified, while simultaneously the object starts to disintegrate (Cronjé, 2014:40).

Referencing the ideas presented by Elaine Scarry in her book *The Body in Pain: The Making and Unmaking of the World* (1985), Cronjé suggests that the act of making could affirm a sense of self-awareness by manifesting the self in an object external to the body (2014:40). In making the *Counter-body (fist)* object and similar artworks, the artist records an instant of her presence in the world and in her own body, but the made object (clay imprinted with a trace of the fingers/fist that closed in on the clay in the process of making) does not only bear witness to the artist's presence through the physical impression of fingerprints on the work, it is also inscribed with traces of the act of making itself (Cronjé, 2014:40).

Scarry writes that our internal state of being is often accompanied by things that exist outside the body; for example, our feelings for someone or something, or we are afraid of someone or something that exists external to our own bodies where these feelings are experienced (1985:5). Most of a human's "emotional, perceptual and somatic states [take on] an object" and, according to Scurry, this affirms "the human being's capacity to move out beyond the boundaries of his or her own body into the external, sharable world" (1985:5).[69]

[69] Elaine Scurry continues to explain that pain disrupts the list of "emotional, perceptual and somatic states that take an object" because pain itself does not take an object; "it is not *of* or *for* anything" (1985:5).

In Christine Cronjé's opinion, the act of making has the role of a tool that can be used to mediate between our internal states and the external world, because one cannot engage with the act of making without actually making something; be it material or a form of abstraction (2014:40). When Cronjé presses the clay between her hands, she impresses her own presence at that moment into the clay and, as mentioned above, her 'being' (in her body and in the world) is manifested in the tangible object exterior to her body (2014:40).

During the act of making there are two stages of transformation in the making process (Scarry, 1985:290). The first transformation is "from an invisible aspect of consciousness to a visible but disappearing action", and the second "from a disappearing action to an enduring material form" (Scarry in Cronjé, 2014:40). To refer to the earlier discussion on time-based versus results-based work, we can consider the following: if the artist is making with the "enduring material form" as his or her primary focus, the process can be described as results-based, but if the "enduring material form" is rather a by-product of the process of making where the "visible but disappearing action" is of primary concern, the process can be described as time-based. Both types of processes follow the same transformative paths and in these the act of making is suspended at some point and an "enduring material form" is achieved. About the stages of transformation Cronjé explains that

> "[t]hese two stages of transformation clearly stipulate the direct loss/disappearance of the act of making/'being' and its simultaneous recognition, even recollection, of this act through the presence of the art object as the artefact of making" (2014:42).

In weaving, my presence is important in the process of making. The process in turn is of primary importance to me, but I also cannot (and do not wish to) escape the made object that is formed through my act of making. The object does not indicate my hand as overtly as it does in Cronjé's *Counter-body* series, yet my hand-woven object cannot exist without the presence of the hand. Therefore, even without the visible evidence of fingerprints, my art object tells of a human absence, and of a presence in the past. I am specifically concerned with the notion of presence and absence from the object in my performance *In Time.*

Fig. 56. Marguerite Roux. 2017. *In Time.* Performance.

During the first performance of this piece, I set up my loom in a gallery space and I was present as part of the artwork [Fig. 56], publicly engaging with the act of making for four hours a day over two (non-consecutive) days. Outside these hours my work existed as an object that has already transformed into an "enduring material form" (Scarry in Cronjé 2014:40) that could be read as a signifier of my presence/absence/'being'.

The body can be regarded as a threshold between the inner self and objects in the world, but the body also exists as an object in the world alongside other objects (Cronjé, 2014:42). Cronjé argues that the body functions in a similar way during the act of making; the body is a threshold between the artist/maker and the made object, while the body simultaneously also functions as an object in the world.

Once the threshold is breached (arguably at the point when the making process is regarded as complete), the object can be deemed to be a result of the making that brought about its existence (Cronjé, 2014:42-46). When looking at the absence or (bygone) presence of the artist from the made object [Fig. 57], one could recognise the life of the object after production. The object may be an artefact or by-product of the process of making, or it may be the sought-after end result of a process of making. In both cases, when presented to a viewer it can be acknowledged as an object that exists on its own terms, but that speaks of the process that shaped it, and perhaps also of something more[70].

[70] Political theorist Jane Bennett has written extensively on the power and vitality of non-human bodies. She explains that "[t]hing-power gestures toward the strange ability of ordinary, man-made items to exceed their status as objects and to manifest traces of independence or aliveness" (Bennett, 2010:xvi). The notion of objects as things with power relates interestingly to the status of a made-object after it has been made and when it is left to exist as a thing in itself. Bennett's idea of vital matter acknowledges the potential significance of objects as dynamic.

Cronjé quotes Rupert Shepherd from the Ashmolean Museum of Art and Archaeology, who says that “once created, objects [take] on their own existence, both independent of and intimately related to their creators …” (2014:44). Signification in Cronjé’s fist objects occurs through the impressions on the object that bear witness to the making. Signification further occurs through the physical and material existence of the made object itself (2014:44). Therefore, she writes that “once the threshold has been breached, the made object operates as an attestation or embodiment of the artist’s lost presence as well as pertaining to its own object-ness” (Cronjé, 2014:44).

Fig. 57. Marguerite Roux. 2017. *In Time.* Performance.

As I am tediously weaving with fragile, old, fax paper (that has already started to yellow in places and will certainly not last many years) the whole process could seem redundant. It is time consuming, yet the product itself will not last for a particularly long time. However, although the creation and the act of making take primary importance, the act of making art is not only for the sake of making art; it is done for the purpose of investigating and experimenting with overwhelming concepts like our perception and experience of time. I considered the question earlier if more time spent equals a job done well. I do spend a lot of time weaving, but it does not necessarily result in a substantial ‘object’ outcome, but rather, hopefully, a more conscious experience of my own presence in the world and in time.

CONCLUSION

In the process of weaving manuscripts from easily accessible and widely distributed public documents like till slips and telephone books, I hope to savour the importance of the information contained in these documents. I hope to celebrate nearly forgotten (perhaps amputated) technologies that were once useful and exciting, as important foundations for new, mostly digital technologies. My investigation is not based on a longing to revert back to older tools or previous technologies, instead it is a response to our current digital age and ‘quick-fix’ lifestyle. I do not reject this lifestyle. Rather, through my practice, I hope to ground and embed myself within this lifestyle so as to emphasise an awareness of where we have come from (and what we leave behind), but also where we are headed.

The value of understanding the polemics surrounding technology and weaving and its uses throughout time and within different contexts has enriched and deepened my understanding of my own practice. The act of weaving is not neutral or 'innocent'. Instead it is loaded with historical and social connotations. The act of weaving is imbued with histories of weaving, preserved through the medium itself. Investigating these histories, coming to terms with them, working with them, and perhaps even subverting them at times, strengthens my craft as a conceptual practice, and arguably even as a political practice.

I am an artist in a specific socio-economic and political context. My weaving, working with a self-identified machine-body contributes to a practice of introspection. I cultivate self-awareness, an indispensable tool in a fast-changing world. My process is about identifying my self in a world defined, ever more radically, by technology and the human relationship to technology and to machines. Investigating the act of weaving as a method

of taking time encourages a consciousness of ‘being’ in a ‘fast-paced’ environment.

Similar to counting rice kernels, my investigation is about systematically cultivating a feeling of presence in the present moment. This systematic approach is not dominated by the overwhelming rule of the clock, but instead resonates with the flow of (clock) time; sometimes suspending clock-like notions of time and at other times appreciating the clock as a catalyst to action. My practice involves very personal reflections on my own behaviours, perceptions, relationships to time(s), and specifically engages personal memory.

I have studied different theories of time, but more importantly, through my practice, I have the opportunity to experience time differently; I can play with time in a variety of ways. Time and the passage of time are evident in the circles of a cut-down cypress tree and visible in yellowing old fax-paper. The traces of time are everywhere. I consider time in the relevance of contact numbers in the telephone book and it is emphasised through the decrease in value of documents like till slips and marketing flyers. My experience of time manifests in the non-linear nature of my memories and it is seen in the development of opinions on industry and production over the years since the industrial revolution. Finally, the evidence of time is found in sheets of woven paper, the by-products of my weaving, that evidence my presence, historical consciousness, labour and time.

LIST OF FIGURES

SOURCES CONSULTED

A.I. Artificial Intelligence (film). 2001. directed by Steven Spielberg. USA: Amblin Entertainment & Stanley Kubrick Productions.

Adolphs, R. 2008. Fear, Faces, and the Human Amydala. *Current Opinion in Neurobiology*. 18:166-172.

Allenby, B.R. & Sarewitz, D. 2011. *The Techno-Human Condition.* Cambridge: The MIT Press.

Albers, A. 1965. *On Weaving*. Middletown: Wesleyan University Press.

Appelrouth, S. & Edles, L.D. 2008. *Classical and Contemporary Sociological Theory: Text and Readings*. California: Pine Forge Press.

Arendt, H. 1958. *The Human Condition.* Chicago: University of Chicago Press.

Applegate A., Zedeño N. 2001. Site E-92-9: A Possible Late Neolithic Solar Calendar, in F. Wendorf & R. Schild. *Holocene Settlement of the Egyptian Sahara,* vol. 1. Boston: Springer Sicence+Business Media, LLC.

Arnold, M. 2016. Between Union and Liberation: Women Artists in South Africa 1910-1994. Abingdon: Routledge.

Aspin, C. 1964. *James Hargreaves and the Spinning Jenny.* Helmshore: Helmshore Local History Society.

Balme, J.H. 2012. To Love One's Enemies: The Work and Life of Emily Hobhouse. Canada: Hobhouse Trust.

Becker, E. 1962. *The Birth and Death of Meaning*. New York: The Free Press.

Bell, S.G. & Offen, K.M. (eds.) 1983. *Women, the Family, and Freedom: 1880 – 1950.* Stanford: Standford University Press.

Bennett, J. 2010. *Vibrant Matter: A Political Ecology of Things.* Durham & London: Duke University Press.

Bergson, H. 1910. Time and Free Will: An Essay on the Immediate Data of Consciousness. F.L.Pogson (tr.). London: George Allen.

Bernet, R., Welton, D. & Zavota, G. 2005. Edmund Husserl: The Nexus of Phenomena: Intentionality, Perception, and Temporality. New York: Routledge.

Birth, K.K. 2012. *Objects of Time: How Things Shape Temporality.* New York: Palgrave Macmillan.

Birzaka-Priekule, L. 2017. *Aizvien vairāk un vairāk no vēl mazāk un mazāk* [Online]. Available: http://www.arterritory.com/print.php?lang=lv&id=6511 [2017, October 19].

Blade Runner (film). 1982. Directed by Ridley Scott. USA: The Ladd Company, Shaw Brothers & Blade Runner Partnership.

Bordwell, D. 2002. Intensified Continuity: Visual Style in Contemporary American Film. *Film Quarterly*. 55(3), Spring:16-28.

Bordwell, D. & Thompson, K. 2008. *Film Art: An Introduction*. New York: McGraw-Hill.

Borgdorff, H. 2012. The Conflict of the Faculties: Perspectives on Artistic Research and Academia. Amsterdam: Leiden University Press.

Bowling, A. 1997. *Research Methods in Health*. Buckingham: Open University Press.

Braudel, F. 1982. Civilization and Capitalism, 15th-18th Century: The Structure of Everyday Life. California: University of California Press.

Brearly, H.C. 1919. *Time Telling Through the Ages*. New York: Doubleday, Page & Co. [Online]. Available: http://www.gutenberg.org/files/47928/47928-h/47928-h.htm [2017, October 19].

Broglio R. 2016. Posthuman Self and Technology with Adam Nocek and Ron Broglio (video) [Online]. Available: https://www.youtube.com/watch?v=5ALvdmeV5WU [2017, October 18].

Broudy, E. 1997. *The Book of Looms.* London: Studio Vista.

Bryan, K. 2017. Body Loom, 5’44’’ (E-mail) [Online]. Available: kaileybryanart@gmail.com.

Bryan, K. 2017. Body Loom, 5’44’’ [Online]. Available: http://kaileybryan.ca/index.php/2017/01/17/body-loom-5-4/#! [2017, October 19].

Burns, J. 2015. *Early Trains Were Thought to Make Women’s Uteruses Fly Out* [Online]. Available: http://mentalfloss.com/article/67806/early-trains-were-thought-make-womens-uteruses-fly-out [2017, October 18].

Cambridge English Dictionary. 2017. S.v. 'results-based' [Online]. Available: http://dictionary.cambridge.org/dictionary/english/results-based [2017, October 18].

Cambridge English Dictionary. 2017. S.v. 'time-based' [Online]. Available: http://dictionary.cambridge.org/dictionary/english/time-based [2017, October 18].

Candlin, F. 2000. Practice-Based Doctorates and Questions of Academic Legitimacy. *International Journal of Art and Design Education*, 19(1):6-101.

Carrico, R. 2008. Snaps, Clicks, Ticks, Tocks: Temporality and Fingertips. *Extensions: The Online Journal of Embodiment and Technology,* 4:1-10 [Online]. Available: http://www.extensionsjournal.org/files/2008/article/pdf/Carrico.pdf [2017, October 18].

Candy. L. 2006. *Practice-Based Research: A Guide*. CCS Report. [Sydney]: Creativity and Cognition Studios, University of Technology [Online]. Available: https://www.creativityandcognition.com/resources/PBR%20Guide-1.1-2006.pdf [2017, October 18].

Cascone, K. 2000. "Post-Digital" Tendencies in Contemporary Computer Music. *Computer Music Journal*. 24(4), Winter:12-18.

Clicqué, G.M. 2005. "Anything Goes?" Theology and Science in a Culture Marked by Postmodern Thinking. *European Journal of Science and Theology.* 1(2), June:27-33.

Combrink, L. & Marley, I.R. .2009. Practice Based Research: *Tracking Creative Craetures* in a Research Context. *Literator*. 30(1) April:177-206.

Creswell, J.W. 2014. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. London: SAGE Publications.

Cronjé, C. 2014. On Breath and Ash: Meditations on the (Im)materiality of 'Being'. Unpublished Master's Thesis. Cape Town: Michaelis School of Fine Art, University of Cape Town.

Dame, J.C. 2007. *Why is a minute divided into 60 seconds, an hour into 60 minutes, yet there are only 24 hours in a day?* [Online]. Available: http://tf.boulder.nist.gov/general/pdf/2209.pdf [2017, October 18].

Davis, M. & Davis, V. 2005. Mistaken Ancestry: The Jacquard and the Computer.*Textile,* 3(1), May:76-87.

Douglas, A., Scopa, K. & Gray, C. 2000. Research Through Practice: Positioning the Practitioner as Researcher. *Working papers in art and design*. 1. [Online]. Available: https://www.herts.ac.uk/__data/assets/pdf_file/0018/12285/WPIAAD_vol1_douglas_scopa_gray.pdf [2017, October 18].

De Vos, A.S., Strydom, H., Fouché, C.B. & Delport, C.S.L. (eds.). 2010. *Research at Grass Roots*. Pretoria: Van Schaik Publishers.

Droit-Volet, S. & Meck, W.H. 2007. How Emotions Colour our Perception of Time. *Trends in Cognitive Sciences* 11(12):504-513.

Droste, M. & Bauhaus-Archiv. 2002. *Bauhaus, 1919-1933.* Berlin: Taschen.

Einstein, A. & Lawson, R.W. 2001. *Relativity: The Special and General Theory.* New York: Dover Publications.

Engel, B. 2014. *Afraid of the Machine: Technophobia in Modern Literature* [Online]. Available: http://davidabramsbooks.blogspot.co.za/2014/07/afraid-of-machine-technophobia-in.html.

Ferrando, F. 2013. *Humans, Cyborgs, Posthumans* (video) [Online]. Available: https://www.youtube.com/watch?v=RGjMUw03Bv0 [2017, October 18].

Fine, S. 1953. The Eight-Hour Day Movement in the United States, 1888-1891. *The Mississippi Valley Historical Review.* 40(3). Dec:441-462.

Folds, B. 2001. *Annie Waits* [Online]. Available: https://play.google.com/music/preview/Tp4pfrjwcdfyxj5x2qr2v3iyu5u?lyrics=1&utm_source=google&utm_medium=search&utm_campaign=lyrics&pcampaignid=kp-songlyrics pdf [2017, October 18].

Fouché, C.B. & Schurink, W. 2011. Qualitative Research Designs, A.S. de Vos, H. Strydom, C.B. Fouché & C.S.L. Delport (eds.). *Research at Grass Roots*. Pretoria: Van Schaik Publishers. 307-327.

Francisco, C.L. 2016. *Making the Cloth for the Royal Purple* [Online]. Available: http://clfrancisco.com/tag/spinning/ [2017, October 18].

Franklin, B. 1748. *Advice to a Young Tradesman* [Online]. Available: https://liberalarts.utexas.edu/coretexts/_files/resources/texts/1748%20Franklin%20Advice.pdf [2017, October 18].

Friedman, T.L. 2016. Thank you for being late: An Optimist's Guide to Thriving in the Age of Accelerations. New York: Farrar, Straus, and Giroux.

Fuentes, A. & Ehrenreich, B. 1983. *Women in the Global Factory.* Boston: South End Press.

Gadalla, M. 2017. *Egyptian Divinities: The all who are The One.* Greensboro: Tehuti Research Foundation.

Gaffney, V. *et al.* 2013. Time and Place: A Luni-solar 'Time-Reckoner' from 8th Millenial BC Scotland. *Internet Archeology*. 34 [Online]. Available: http://intarch.ac.uk/journal/issue34/gaffney_index.html [2017, October 18].

Gale, R.M. 2007. *The Divided Self of William James.* Cambridge: Cambridge University Press.

Gale Encyclopedia of U.S. Economic History. 2001. Working Conditions in Factories (Issue) [Online]. Available: http://www.encyclopedia.com/history/encyclopedias-almanacs-transcripts-and-maps/working-conditions-factories-issue [2017, October 18].

Groom, A. (ed.). 2013. *Time: Documents of Contemporary Art.* London: Whitechapel Gallery.

Halacy, D. 1970. *Charles Babbage, Father of the Computer*. New York: Crowell-Collier Press.

Hannula, M., Suoranta, J. & Vadén, T. 2005. *Artistic Research - Theories, Methods & Practices.* Helsinki: Academy of Fine Arts.

Haraway, D. 1984. A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century, in *Simians, Cyborgs and Women: The Reinvention of Nature. New York:* Routledge. 149-181.

Haraway, D. 1991. Simians, Cyborgs and Women: The Reinvention of Nature. New York: Routledge.

Hartnett, S. (ed.). 2011. Challenging the Prison-Industrial Complex: Activism, Arts, and Educational Alternatives. Illinois: University of Illinois Press.

Harvey-Brown, S.C. 2014. *What Weaving Means to Me.* [Online]. Available: http://www.theloomroom.co.uk/what-weaving-means-to-me [2017, October 18].

Haseman, B. C. 2006. A Manifesto for Performative Research. *Media International Australia Incorporating Culture and Policy: Quarterly Journal of Media Research and Resources*. 118 February:98-106 [Online]. Available: http://eprints.qut.edu.au/3999/ [2017, October 18].

Hassan, I. 1977. Prometheus as Performer: Toward a Posthuman Culture? *The Georgia Review*. 31(4), Winter:830-850.

Haus der Kunst 2012. *Artist Talk — Janet Cardiff & George Bures Miller with Carolyn Christov-Bakargiev* (video) [Online]. Available: https://www.youtube.com/watch?v=xMWd50TmuHs [2017, October 18].

Hecht, A. 1989. *The Art of the Loom*. London: The British Museum Press.

Holt, J. *The Changing Representations of Women: The Art of Hannah Wilke, Lynda Benglis, and Cindy Sherman* [Online]. Available: http://www.brooklyn.cuny.edu/pub/departments/bcurj/pdf/HoltJessicaART.pdf [2017, October 18].

Honoré, C. 2004. In Praise of Slow: How a Worldwide Movement is Challenging the Cult of Speed. London: Orion Books.

Hopkins, E. 2013. Industrialisation and Society: A Social History, 1830-1951. Hoboken: Taylor & Francis.

Horrocks, A.R., & Anand, S.C. (eds.). 2000. *Handbook of technical textiles.* Burlington: CRC Press.

Hultén, P. 1968. The Machine as Seen at the End of the Mechanical Age [Press Release]. [Online]. Available: https://www.moma.org/documents/moma_press-release_326596.pdf [2017, October 18].

Huyssen, A. 2012. Twilight Memories: Marking Time in the Culture of Amnesia. New York: Routledge.

Jenkins, D.T. 2003. *The Cambridge History of Western Textiles.* Cambridge: Cambridge University Press.

Johansen, M.F. 2013. *A Few Relevant Images Including Descriptions* [Online]. Available: http://martinfjohansen.com/ocon2013/images.html [2017, October 19].

Kappelman, T. 2001. *Marshall McLuhan: The Medium is the Message*. [Online]. Available: http://www.leaderu.com/orgs/probe/docs/mcluhan.html [2017, October 18].

Kaprow, A. & Lee, M. 1966. On Happenings. *The Tulane Drama Review,* 10(4). Summer:281-283.

Kaur, R., Kumar, P. & Singh, R.P. 2014. A Journey of Digital Storage from Punch Cards to Cloud. *IOSR Journal of Engineering*. 4(3), March:36-41.

Kelly, M.R. n.d. Phenomenology and Time-Consciousness, in *Internet Encyclopedia of Philosphy* [Online]. Available: http://www.iep.utm.edu/phe-time/ [2017, October 18].

Kern, S. 1983. *The Culture of Time and Space, 1880-1918.* Cambridge: Harvard University Press.

Koepnick, L.P. 2014. *On Slowness: Toward an Aesthetic of the Contemporary.* New York: Columbia University Press.

Horn, R. 2009. *Finger Gloves* [Online]. Available: http://rebeccahornart.blogspot.co.za/2009/11/finger-gloves-1973.html [2017, October 19].

Kruger, K.S. 2001. Weaving the Word: The Metaphorics of Weaving and Female Textual Production. Selinsgrove: Susquehanna University Press.

The Transcendent Man (film) 2009. Directed by Barry Ptolomy. USA: Ptolemaic Productions & Therapy Studios.

Lightman, A. 1993. *Einstein's Dreams*. New York: Vintage Books.

Lippard, L.R. 1976. From the Center: Feminist Essays on Women's Art. New York: Dutton.

Lovrenčić, A., Konecki, M. & Orehovački, T. 2009. 1957-2007: 50 Years of Higher Order Programming Languages. *JIOS*. 33(1):79-150.

MAI - Marina Abramović Institute. 2014. Marina Abramovic – Counting Rice (video) [Online]. Available: https://www.youtube.com/watch?v=CQgHYsWkN-M [2017, October 18].

MAI - Marina Abramović Institute. 2002. Marina Abramovic on The House with the Ocean View (video) [Online]. Available: https://vimeo.com/72468884 [2017, October 18].

Malins, P. 2004. Machinic Assemblages: Deleuze, Guattari and an Ethico-Aesthetics of Drug Use. *Janus Head*. 7(1):84-104.

Malterud, K. 2001. Qualitative research: Standards, challenges and guidelines. *The Lancet*. 358:483-488.

Maycroft, N. 2005. *Labour, Work and Play: Action in Fine Art Practice* [Online]. Available: http://eprints.lincoln.ac.uk/2065/1/The_Labour_of_Art.pdf [2017, October 18].

McHugh, E. 2010. *Auburn Correctional Facility.* New York: Arcadia Publishing.

McKeon, R. 1974. Time and Temporality. *Philosophy East and West.* 24(2):123-128.

McLuhan, M. 1964. *Understanding Media The Extensions of Man.* [Online]. Available: http://robynbacken.com/text/nw_research.pdf [2017, October 18].

Meck, W.H. 2005. Neuropsychology of Timing and Time Perception. *Braind and Cognition*. 58(1), June:1-8.

Merleau-Ponty, M. 1962. *Phenomenology of Perception*. C.Smith (tr.). London: Routledge & Kegan Paul.

Merleau-Ponty, M. 1968. *The Visible and the Invisible*. A. Lingis (tr.). Evanston: Northwestern University Press.

Modern Times (film). 1936. Directed by Charlie Chaplin. USA: Charlie Chaplin.

Murdock, n.d. *Neith, Virgin Mother of the World* [Online]. Available: http://www.truthbeknown.com/neith.html [2017, October 19].

Murphy, W.E. 1896. *History of the Eight Hours' Movement.* Melbourne: Spectator Publishing Company.

Musgrove, M. & Cairns, J. 2001. *The Spider Weaver: A Legend of Kente Cloth.* New York: The Blue Sky Press.

Oxford English Dictionary. 2017. S.v. ‘weave’ [Online]. Available: https://en.oxforddictionaries.com/definition/weave [2017, October 18].

Phillips, P.C. 1989. Temporality and Public Art. *Art Journal,* 48(4), Winter:331-335.

Picabia, F. & Lowenthal, M. 2007. I am a Beautiful Monster: Poetry, Prose, and Provocation. Cambridge: MIT Press.

Pine, C. 1989. *Understanding the Theory of Relativity* [Online]. Available: http://personal.tcu.edu/dingram/edu/pine2.html [2017, October 19].

Plant, S. 1995. The Future Looms: Weaving Women and Cybernetics. *Body & Society*. 1(3-4):45-64.

Plant, S. 1995. Zeros and Ones, Digital Women and the New Technoculture. London: Fourth Estate.

Ploeger, D. & Sagan, N. (eds.). 2010. *Post-Human//Future Tense* (catalogue). PH//FT Press [Online]. Available: https://issuu.com/nicholassagan/docs/post_human_future_tense_issuu [2017, October 18].

Ploeger, D. 2010. Being-Human as Evolving Memory: Art and Posthumanism in The Present Tense, in D. Ploeger & N. Sagan (eds.). *Post-Human//Future Tense* (catalogue). PH//FT Press. 9-14. [Online]. Available: https://issuu.com/nicholassagan/docs/post_human_future_tense_issuu [2017, October 18].

Ptak, J.F. n.d. *An Episode in the History of Holes: Electricity, Punched Cards and the Computer, 1878* [Online]. Available: http://longstreet.typepad.com/thesciencebookstore/2011/03/electricity-punched-cards-and-the-computer-1877.html [2017, October 19].

Sagan, N. 2010. How Time Became Posthuman, in D. Ploeger & N. Sagan (eds.). *Post-Human//Future Tense* (catalogue). PH//FT Press. 25-29. [Online]. Available: https://issuu.com/nicholassagan/docs/post_human_future_tense_issuu [2017, October 18].

Scarry, E. 1985. The Body in Pain: The Making and Unmaking of the World. New York: Oxford University Press.

Scrivener, S. 2002. The Art Object does not Embody a Form of Knowledge. *Working Papers in Art and Design*. 2. [Online]. https://www.herts.ac.uk/__data/assets/pdf_file/0008/12311/WPIAAD_vol2_scrivener.pdf [2017, October 18].

Shabaka, O. 2012. *What is Time-Based Art?* [Online]. Available: http://www.artlab33.com/2012/07/what-is-time-based-art/ [2017, October 18].

Shanahan, M. 2015. *The Technological Singularity.* Cambridge: MIT Press.

Shanken, E. 2002. Art in the Information Age: Technology and Conceptual Art. *Leonardo*. 35(4): 433-438.

Skelly, J. 2017. Radical decadence: Excess in Contemporary Feminist Textiles and Craft. New York: Bloomsbury.

Smirna, K. 2017. *Performance Art and its Journey to Recognition* [Online]. Available: https://www.widewalls.ch/performance-art/ [2017, October 19].

Smith, D.E. 1958. *History of Mathematics*, vol. 1. New York: Dover Publications Inc.

Sondhelm, W.S. 2000. Technical Fabric Structures – 1. Woven Fabrics, in A.R. Horrocks & S.C. Annand (eds.). *Handbook of Technical Textiles.* Burlington: CRC Press. 62-94.

Springgay, S., Irwin, R.L. & Kind, S.W. (2005) A-r-tography as Living Inquiry Through Art and Text. *Qualitative Inquiry*. 11(6):897-921.

Stafford, A. 2016. *The Loom at Rest*. [Online]. Available: http://www.voicesofindustry.com/voicesofindustry/text/2016/9/26/the-loom-at-rest-as-essay / [2017, October 18].

Stehr, M. 2016. Liza Grobler's No More Worlds to Conquer. *Visi.* [Online]. Available: https://www.visi.co.za/liza-groblers-no-more-worlds-to-conquer/ [2017, October 18].

Sterne, L. 1759 - 1767. *The Life and Opinions of Tristram Shandy, Gentleman*, vol.1 – 9. London: Methuen and co.

Suisman, D. 2010. Sound, Knowledge, and the "Immanence of Human Failure". *Social Text*. 28(1), Spring:13-34.

Swan, M. 2016. *A New Theory of Time: X-tention is Simultaneously Discrete and Continuous* [Online]. Available: http://futurememes.blogspot.co.za/2016/04/a-new-theory-of-time-x-tention-is.html [2017, October 18].

Terminator (film). 1984. Directed by James Cameron. USA: Hemdale, Pecific Western & Cinema '84.

Monday, May 18. 1719. 1923. *The Free Thinker.* 3(121), May:123-128.

Thomson, A. & Blanc, S.L. 1862. An Historical Account of the Luddites of 1811, 1812, and 1813. Huddersfield: J. Cowgill.

Toadvine, T. & Lawlor, L. 2007. (eds.). 2007. *The Merleau-Ponty Reader.* Illinois: Northwestern University Press.

Triggs, O.L. 2014. *The Arts & Crafts Movement.* New York: Parkstone International.

Watling, L. 2012. *Rebecca Horn. Finger Gloves. 1972.* [Online]. Available: http://www.tate.org.uk/art/artworks/horn-finger-gloves-t07845 [2017, October 18].

Whitehead, J.J. 2012. Challenging the Hand; Critical Confrontations of Female Craft and Animal Artefact in Post-Apartheid Visual Art. Unpublished Master's Thesis. Stellenbosch: Stellenbosch University.

Whitney, S. 2010. The Grid, Weaving, Body and Mind. *Textile Society of America Symposium Proceedings* [Online]. Available: http://digitalcommons.unl.edu/tsaconf/60 [2017, October 18].

Willis, D. 1999. The Emerald City and Other Essays on the Architectural Imagination. New York: Princeton Architectural Press.

Wilson, M. 2015 *Custom Pendant Tube Lights for Christine Cronje's exhibition 'On Breath and Ash'* [Online]. Available: http://www.martinwilson.co.za/art-engineering/past-projects/ [2017, October 19].

Wood, R.E. 2013. The Knitter's Tale: A Practice-Led Approach to Framework Knitting Through a Contemporary Exploration of Traditional Practices, Patterns, Skills And Stories. Unpublished Doctoral Dissertation. Nottingham: Nottingham Trent University.

Woodcock, G. 1944. The Tyranny of the Clock, in A. Groom (ed.). *Time: Documents of Contemporary Art*. London: Whitechapel Gallery. 65-66.

Xin, B., Hu, J., Baciu, G. & Yu, X. 2011. Development of Weave Code Technology for Textile Products. *Fibres and Textiles in Eastern Europe*. 19(2):33-35.

Young, M. 2015. *Marina Abramović: In Residence* [Online]. Available: http://artasiapacific.com/Blog/MarinaAbramovicInResidence [2018, October 19].